

Appendix 3

Structures Inside RHCAs

**Compliance with PACFISH MM-2 as it relates to
potential impacts to streams and RHCAs**

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INTRODUCTION

This appendix evaluates structures proposed for use that are located inside Riparian Habitat Conservation Areas (RHCA) for compliance with PACFISH MM-2 as it pertains to potential impacts to 1) streams and 2) RHCAs (terrestrial impacts). Compliance with MM-2 as it pertains to FISHERIES is found in the *Fisheries Section* of Chapter 3.

MM-2: *Locate structures, support facilities, and roads outside Riparian Habitat Conservation Areas. Where no alternative to siting facilities in Riparian Habitat Conservation Areas exists, locate and construct the facilities in ways that avoid impacts to Riparian Habitat Conservation Areas and streams and adverse effects on listed inland native fish [or anadromous fish].*

Where no alternative to road construction exists, keep roads to the minimum necessary for the approved mineral activity. Close, obliterate and revegetate roads no longer required for mineral or land management activities.

Compliance is evaluated for Alternative 2 (miner's proposal) and Alternative 3 (proposal with FOREST SERVICE requirements). The following features are considered structures:

- 1) Settling ponds (would receive sediment)
- 2) Temporary mine-access roads
- 3) Forest Service closed or decommissioned roads
- 4) Existing or Temporary bridges.

DETERMINING COMPLIANCE WITH PACFISH MM-2

Streams: Compliance with MM-2 as it pertains to streams is determined by assessing whether use of existing structures, or construction and use of proposed structures, would impact 1) water quality, 2) inchannel complexity, or 3) channel morphology.

Potential impacts to **water quality** include 1) increases in water temperatures, 2) increases in heavy metal concentrations, and/or 3) reductions in water clarity. (all discharge related)

Potential impacts to **inchannel complexity** include 1) reduction in pool frequency or quality related to inputs of sediment, 2) change in substrate sediment related to inputs of sediment, and 3) loss of lower bank angle or undercuts related to bank failures. (mix of discharge related or placement of structure such that it destabilizes the banks)

Potential impacts to **channel morphology** include 1) loss of bank stability due to bank failures, 2) loss of lower bank angle due to bank failures (also known as bank undercuts) and 3) increases in width/depth ratio. (placement of structure such that it destabilizes the banks and results in channel widening and/or bed aggradation)

RHCA impacts (terrestrial impacts): Compliance with MM-2 as it pertains to activity inside the RHCA is determined by assessing whether use of existing structures, or construction and use of proposed structures, would impact 1) short soil productivity, 2) long-term soil productivity, and 3) riparian vegetation.

Potential impacts to **soil productivity** include 1) new disturbance due to new roads and ponds which alters soil stratigraphy, groundwater flow paths, and infiltration capacity (short-term impacts), 2) lack of effective reclamation of these new roads and ponds (long-term impacts), and 3) increased soil erosion related to roads.

Potential impacts to **riparian vegetation** include reductions in the 1) amount, 2) distribution and 3) types of riparian vegetation.

The following four questions are answered to determine compliance:

1. If an operation has proposed or existing structures within an RHCA, can the structures be relocated outside the RHCA and if not, why not?
2. Is construction and/or use of the structures in compliance with MM-2 under Alternatives 2 and 3 as it pertains to streams? As it pertains to activity inside the RHCA?
3. Is there the potential for a discharge via surface and/or subsurface flow under Alternatives 2 and 3 given the existing or proposed locations and characteristics of the structure?
4. Do the answers to questions 3 and 4 vary as a function of Alternative 2 or 3?

NOTE: The analyses reference Forest Service Water Resource Protection Measures (WRPMs) and General Requirements which are added under Alternative 3. The WRPMs are found in **Appendix 1A** and listed by Plan. In Appendix 1A, the information provided by the operators on their ponds is taken directly from the Plans of Operation with the page number in the Plan noted. The Forest Service General Requirements are found in Appendix 2.

NOTE: The term “**pond**” is used in the discussions below and throughout this document only for consistency because this is how the water sources and settling areas for the proposed mining are referred to in the proposed Plan. However, from the perspective of Oregon Water Resources Department the term “**pond**” has a distinct meaning. A “**pond**” is considered a reservoir and requires a water right. In contrast a “**sump**” is defined as “a hole dug to a depth of ten feet or less with a diameter greater than ten feet in which ground water is sought or encountered (OAR 690-200-0050). In some cases, the source water proposed for use would fall under the definition of a **sump**. In other cases, a water right may be required for use.

If a Plan has a water right, then the permit number and the volume, if provided, is noted.

ANALYSIS of COMPLIANCE

Altona (Placer)

Site visited by Chris Helberg (Minerals Administrator, UNF) in 2010, 2011, and 2012 as part of her annual mining inspection. Field observations are from Chris.

Structures related to the Altona operation that were evaluated for compliance with MM-2 are 1) two existing temporary access roads and 2) the proposed temporary access road. The source water pond could not be evaluated because the miner could not find the adit, which was to be the water source.

Plan information

Two small off-channel ponds will be constructed near the effluent from the collapsed portal. This adit water will be gravity fed through a pipe into the ponds and will be used to process placer gravels (p. 5).

Ponds will each be approximately 10' x 20' x 10' (p. 7).

Source of processing water = adit discharge.

Field observations

Quartz Gulch has intermittent flow in this area because the Pete Mann ditch diverts flow upstream of the claim. The creek is considered seasonally fish-bearing. RHCA width = 300 feet/side. Valley bottom width varies between 100 to 300 feet wide. The creek is on private land and the private/Forest Service land boundary varies between 10 to 130 feet north of the

stream depending on stream location. The creek lies on the southern edge of a previously dredged area. Shrubs now exist in between the rock along the creek and throughout the old dredge tailings.

Pond-specific information

The proposed settling ponds are located near the private/Forest Service boundary and would be inside the RHCA. The collapsed adit (water source) was not found. Discussions with the miner on October 5, 2010 found that the miner also could not find the collapsed adit. **Therefore, the adit effluent as a water source and the ponds could not be analyzed in this document.**

Road-specific information

Miner proposes to use three Forest Service closed roads, one open Forest Service road, three existing temporary access (TA) roads and one proposed temporary access (TA) roads (Appendix 6).

Forest Service closed roads 1305-092, 098, 099 are unusable and Forest Service open road 1305-080 is unusable due to a washout. All would require considerable work to make them usable. Several have portions that cross drainages. Use of these roads is not required to access the site and these roads are NOT discussed further.

The existing TA roads (1042-E1a and 1042-E1b) and the proposed TA road 1042-M1a are at least 250 feet from the drainage but within the RHCA of Quartz Gulch. They are all native surface roads. There is sufficient ground cover to trap any sediment that leaves the roads prior to reaching the drainage. Road lengths are as follows: 1042-E1a = 0.56 miles; 1042-E1b = 0.59 miles; 1042-M1a = 0.05 miles.

Pond-specific Conclusions

Source water pond

The source water pond **could not be analyzed** because its location is unknown.

Settling ponds

1. The proposed settling ponds **could not be analyzed** because the location of its water source (the adit) is unknown.
2. Unknown because the miner could not locate the adit which would be supplying the pond water.
3. N/A. No data.
4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

Existing Temporary Access roads

1. The existing temporary access (TA) roads are required in order to access the site which is inside the RHCA. Therefore they cannot be moved out of the RHCA.
2. Use of the existing TA roads would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology because the roads would be at least 250 feet from Quartz Gulch. Therefore, there would be no impacts to the stream or stream banks and no change to width/depth ratios.
 - c) No new soil disturbance or impacts to riparian vegetation as a result of road use because the roads are at least 250 feet from the gulch.
3. No potential for a discharge into Quartz Gulch from use of the existing TA roads because the roads would be at least 250 feet from the gulch, there is sufficient ground cover between the roads and gulch to trap any sediment that leaves the road.
4. Conclusions are the same regardless of alternative.

Proposed Temporary Access road

1. The proposed TA road is required in order to access the site which is inside the RHCA. Therefore it cannot be moved out of the RHCA.
2. Under Alternative 2, use of the proposed TA road would be in compliance with MM-2 *as it pertains to streams* because
 - a) No impacts to water quality due to construction of the two track road and road use for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology due to construction road of the two track road and use because the road would be at least 250 feet from Quartz Gulch. Therefore, there would be no impacts to the stream or stream banks and no change to width/depth ratios.

However, use of the proposed TA road would NOT be in compliance with MM-2 *as it pertains to activity inside the RHCA* because

- c) New detrimental soil disturbance and there are no provisions in the Plan for minimizing disturbance or that the road is closed and obliterated once the mining activity is done.
- d) No impacts to riparian vegetation because the proposed road would be at least 250 feet from the gulch and in an area that does not have riparian vegetation.

Under Alternative 3, the construction and use of the proposed TA road would be in compliance with MM-2 both as it pertains to stream and as it pertains to activity inside the RHCA because of the addition of FS General Requirements Z1-14, R13 (Appendix 2). These protection measures would minimize new soil disturbance and require that these roads be closed, obliterated and revegetated once they are no longer required to the mining activity.

- 3. No potential for a discharge into Quartz Gulch from construction and use of the proposed TA road because the road would be at least 250 feet from the gulch, there is sufficient ground cover in this area to trap any sediment that might leave the road, and General Requirements Z1-14, R13, and any other WRPMs identified at the time of placement would be in place.
- 4. Conclusions vary as a function of alternative.

Belvadear (Placer)

Site visited by the district hydrologist on October 18, 2004 (Field book 2) and October 3, 2012 (Field book 10).

Structures related to the Belvadear mining operation that were evaluated for compliance with MM-2 are 1) an existing pond used as both source water and as a settling pond and 2) one existing TA road. Both structures are inside the RHCA of Olive Creek.

Plan information

A clean water pond approximately 20'x30'x5' which is cut in half by berms exists and water is recycled between the off-channel settling recycling ponds (p. 6).

Water from the spring and from Olive Creek is used for processing....This is done under the water diversion permit for mining that was given to Harry J. Young on April 30, 1937 (p. 8).

Source of processing water = spring and Olive Creek.

Field observations

Olive Creek is a perennial and fish bearing stream. RHCA width = 300 ft/side.

Pond-specific information

The existing pond is inside the RHCA and would be used as both a source water and as a settling pond. Total valley bottom width is less than 300 feet. Stream is incised and confined between tailings. Hydrologist observed two ponds in 2004 and a single pond in 2012. It is expected that the pond will vary in shape and character over time. In 2004, the pond was 40 feet from the creek. In 2012 the pond was moved to the east and is now about 60 feet from the creek. Pond is on flat ground and behind a low berm that borders Olive Creek (about 2.5 feet wide).

Road-specific information

Miner would use existing TA road 1305-E2 to access the mining area. The road is inside the RHCA.

Pond-specific Conclusions

1. The existing source water/settling pond should not be moved outside the RHCA for the following reasons. If pond was moved outside the RHCA the pond would be on the hillslope because the valley bottom width in the area of the pond is less than 300 feet. Hillslope pond would be new construction and therefore new disturbance. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing pond is in a highly stable location, dug into the ground and is supplied by groundwater.
2. Use of the existing pond would be in compliance with MM-2 under both alternatives as it applies to stream conditions and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the pond is not in the channel.
 - c) No impact to channel morphology because the pond is existing and separated from Olive Creek by 60 feet. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) No new soil disturbance because it is an existing pond.
 - e) No impact to the riparian vegetation because there is no riparian vegetation where the pond is located.
3. No potential for a discharge via surface or subsurface flow from the existing pond into Olive Creek under either alternative because the pond is dug into the ground and has silt coating

the pond bed indicating that fine sediment is being trapped in the pond. Therefore there would be no change to water quality.

4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. The road cannot be moved outside the RHCA because it is required to access the site which is located inside the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating access.
2. Use of the TA road be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impact existing water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity or channel morphology because the roads are not in the stream and are 50 feet or more from the stream. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - c) No new soil disturbance because they are existing roads.
 - d) No impact to the riparian vegetation because the roads are existing and more than 50 feet from the stream.
3. No potential for a discharge into Olive Creek because the road bed is stable and separated from Creek by distance, old placer tailings and a berm. These features are effective at trapping any sediment that leaves the road prior to it reaching the creek.
4. Conclusions the same for both alternatives.

Blue Sky/Bull Run (Placer)

Sites (6 mining area and 1 processing area) visited by the district hydrologist on September 18 and 19, 2012 (Field book 7) and September 25 and 28, 2012 (Field book 9).

Structures related to the Blue Sky/Bull Run operation that were evaluated for compliance with MM-2 are 1) existing source water pond, 2) existing settling ponds, 3) existing temporary access roads, 4) the proposed temporary access roads, 5) an existing bridge, and 6) a proposed temporary bridge.

Plan information

A small washing plant or highbankers will be set up at the camp area where several dredge ponds which are not connected to Bullrun Creek. These are over 50 feet from the creek (p. 4).

Water for both the operations will be ground water in the existing dredge ponds..... On the Blue Sky , one or two off channel settling /recycling ponds will be used in the operation approximately 5'x10'x6'....(p.5).

Source of processing water = Groundwater. No surface connection between the ponds and Bull run Creek.

Field observations

Bull Run Creek is perennial and fish-bearing. RHCA = 300 ft/side. Swamp Creek is a mix of perennial and intermittent flow. It has intermittent flow in the vicinity of the existing ford proposed for use and has been mined in the past. Flow becomes perennial in the meadow which begins in the area of mining site Blue Sky #2 and connected to Bull Run Creek by a continuous channel. The portion of Swamp Creek that has perennial flow and connected to Bull Run Creek, may have fish and is therefore assigned an RHCA of 300 ft/side. The portion of Swamp Creek, located upstream of the meadow and in an area with past mining activity, has only intermittent flow and is heavily disturbed. It is considered intermittent and non-fish bearing and assigned an RHCA of 100 feet. Valley bottom width in the area of the processing ponds is about 300 feet and bounded by Bull Run Creek and a hillslope.

Pond-specific information

The processing area is on the south side of Bull Run Creek and on the west side of Swamp Creek. There are six ponds proposed for use and these parallel Bull Run Creek and they are inside the RHCA. The most westerly pond contains water and will be used for processing. There is an ATV trail that parallels the ponds and is on the south side of the ponds.

The ponds are numbered with Pond 1 being the most western pond and Pond 6 being the most eastern pond in the field book. Ponds are separated from each other by berms composed of old placer tailings. Pond 1 is the source water pond and Ponds 2 through 6 are the settling ponds.

Pond 1 has a lot of water and cat tails (no pond dimensions paced).

Pond 2 is very boggy with lush sedges and rushes and some patches of open water (Pond 2 = 40' x 80' paced).

Pond 3 is dry but lush with rushes (20' x 22 'paced).

Pond 4 is dry and lush with rushes and a few sedges (Pond 4 = 22' x 58' paced).

Pond 5 is dry with a couple of boggy areas and lush with rushes (36' x 60').

Pond 6 is dry and lush with rushes and pockets of sedges (40' x 80' paced).

Depths of the pond or bermed depressions are at least 4 feet deep. These features are old dredge ponds. Ponds are separated from Bull Run Creek by a minimum of 50 to 60 feet of tailings and 25 to 30 feet minimum of floodplain. Pond 6 is closest to Swamp Creek and within 25 feet of Swamp Creek. All ponds are on flat ground and are well sealed with fines and vegetation. They are highly stable and there are no concerns about sediment making it to either Bull Run or Swamp Creeks because of the abundance of vegetation in the bottom of the ponds and presence of vegetation along the sides such that sediment will be trapped in the ponds.

Road-specific information

Miner proposes to use four existing and three proposed temporary access roads to access the various sites (Appendix 6). All of these access roads are separated from Bull Run Creek by flat, well-vegetated ground. Distance between the creek and the roads vary 90 to more than 200 feet. All of the roads are inside the RHCAs of Bull Run and Swamp Creeks.

Existing temporary access (TA) roads

7300-E4a is a native surface road that is used by the public to access a dispersed campsite and **Blue Sky sites 1, 2, and 3** and the processing site. It fords Bull Run Creek. Ford approaches are sloped, stable and well rocked. Road length = 0.11 miles.

7300-E4b is a native surface road that is used to access the source water pond and the settling ponds (processing site) and **Blue Sky site 1**. It is a two track on flat ground and is more than 200 feet from Bull Run Creek. It is separated from the creek by the ponds, lush grasses and forbs and downed wood, and old placer tailings. Road length = 0.15 miles.

7300-E4c is composed of old tailings and is used to access **Blue Sky site 2**. Fine road sediment is limited. The road is 94 feet from Swamp Creek and about 200 feet from Bull Run Creek. The road is separated from Swamp Creek by tailings and portions of the meadow that are well vegetated. The road is separated from Bull Run Creek by tailings that parallel Bull Run Creek and a well-vegetated meadow. Road length = 0.02 miles.

7300-M1a is a native surface road that is used by the public. It is bermed at the end and is the connector road to proposed roads 7375-M1b and 7300-M4b. It is about 90 feet from Bull Run Creek and area between the creek and road has downed wood and abundant grasses and forbs. Road length = 0.05 miles.

Proposed temporary access roads

7300-M4b is a proposed temporary two-track road (native surface) that would be used to access **Bull Run site 2**. It would begin at the temporary bridge site proposed by the miner under

Alternative 2 and head downstream. There is 100% ground cover between the proposed general area of road placement and Bull Run Creek. The ground cover is lush grasses, forbs and needles and the ground is largely flat. Road length = 0.15 miles (792 feet).

7375-M1b is a proposed temporary road (native surface). It would access **Bull Run site 2** and connect to 7300-M4b. However, it **ONLY** exists under Alternative 3. It would replace the proposed temporary bridge that would be used to access 7300-M4b under Alternative 2. 7375-M1b would be a two track that would come through the forest to the site. Road placement would occur with Forest Service input. Ground cover between the general area of the proposed road and the creek is partly forest with downed wood and needles and some grasses and forbs and partly meadow with lush grasses and forbs. Road length = 0.2 miles

7300-M4a is a proposed temporary road (native surface) to access **Blue Sky site 3**. The proposed road would be located with input from the Forest Service. There is 100% ground cover between the proposed general area of road placement and Bull Run Creek and the ground cover is lush grasses, forbs and needles. Road length = 0.07 miles.

Bridge-specific information

Existing bridge

There is an existing wooden bridge that crosses Swamp Creek. The bridge is inside the RHCA. Swamp Creek in this area only has intermittent flow, is in an area that was mined in the past, and was dry at the time of the site visit on September 18, 2012.

The existing bridge is adjacent to an existing ford. However, given the size and structure of the bridge, it would only handle foot or ATV traffic. The ford would be used for heavy equipment. Use of the bridge by the miner would decrease how often the ford was used.

Proposed temporary bridge

Under Alternative 2, the miner proposes to install a temporary bridge across Bull Run Creek to access Bull Run site 2. The bridge would be installed and removed each season. The stream banks in area of the proposed bridge are fine grained and well-vegetated with lush grasses. The bridge is dropped under Alternative 3 and access to the site is replaced by proposed road 7375-M1b. This road exists only under Alternative 3.

Pond-specific Conclusions

1. The source water and settling ponds should not be moved outside the RHCA for the following reasons. If the ponds were moved outside the RHCA the ponds would be on the hillslope because the valley bottom width in the area of the ponds is less than 300 feet. Hillslope ponds would be new construction and therefore new disturbance. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g.

in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing ponds are on flat ground, a highly stable location, dug into the ground and supplied by groundwater.

2. Use of the existing source water pond and the settling ponds would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because:
 - a) No impact to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity under either alternative because the ponds are not in the channel.
 - c) No impact to channel morphology under either alternative because the ponds are existing and at least 100 feet from Bull Run Creek. Therefore, there would be no impacts to the stream banks and no change in channel width/depth ratios.
 - d) No new detrimental soil disturbance because the ponds are existing.
 - e) No impact to riparian vegetation because no riparian vegetation exists around the ponds. In addition, the lush rushes and sedges located in the ponds would remain because no activity, other than input of processing water, is proposed.

3. *Source water pond*

No potential for a discharge via surface or subsurface flow from using the source water pond because only withdrawing water.

Settling ponds

No potential for a discharge via surface or subsurface from using the settling ponds into either Swamp or Bull Run Creeks under either alternative because 1) the ponds are old dredge ponds and are capable of holding volumes of water much greater than proposed by the operation and 2) the pond bottoms are vegetated with lush grasses, rushes and sedges. These vegetation types are effective at trapping fine sediment.

4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

Existing Temporary Access (TA) Roads

1. Use of the existing TA roads is required in order to access the sites which are located inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. These roads would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impact existing water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity or channel morphology because the roads are not in the stream and are 50 feet or more from the stream. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - c) No new soil disturbance because they are existing roads.
 - d) No impact to the riparian vegetation because the roads are existing and more than 50 feet from the stream.
3. There is no potential for a discharge into Bull Run Creek because the road beds are stable and separated from Bull Run Creek by distance, old placer tailings and well-vegetated ground. These features are effective at trapping any sediment that leaves the roads.
4. Conclusions the same for both alternatives.

Proposed Temporary Access (TA) Roads EXCEPT TA 7375-M1b

1. Use of the proposed TA roads is required in order to access the sites which are located inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Under Alternative 2, these roads would NOT be in compliance with MM-2 as it pertains to stream and activity inside the RHCA because
 - a) Potential impact to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology because the roads would not be in the stream and not along the stream bank. Therefore, there would be no loss of bank stability and change in width/depth ratio.

- c) New detrimental soil disturbance and no provisions in the Plan to minimize disturbance necessary for access or ensure that these newly constructed two-tracks are obliterated and revegetated.
- d) Potential impacts to riparian vegetation depending on where the road is located.

Under Alternative 3, construction and use of the two-track roads would be in compliance with MM-2 because of the addition of FS General Requirement Z1-14 and R13 (Appendix 2). These requirements ensure that roads will be located with FS input and appropriate soil and water resource protection measures identified and implemented. These resource protection measures include closing, obliterating and revegetating roads once they are no longer required to the mining activity.

3. **Alternative 2**

Potential for a discharge into Bull Run Creek under due to the uncertainty of road locations.

Alternative 3

Discharge potential **would be eliminated** because of the addition of General Requirements Z1-13 (Appendix 2). These General Requirements require that the proposed roads be located with input from the Forest Service and appropriate protection measures implemented. These resource protection measures also include closing, obliterating and revegetating roads once they are no longer required to the mining activity (General Requirement R-13, Z-14(Appendix 2).

- 4. Conclusions vary as a function of alternatives. The Forest Service General Requirements are added to Alternative 3 and these requirements bring the proposed mine access roads into compliance with respect to MM-2 by a) eliminating the potential for a discharge (water quality), b) minimizing the amount of road construction and new soil disturbance, and c) ensuring that roads would be reclaimed once no longer needed for mining activity (General Requirement R-13, Z-14, Appendix 2).

Proposed Temporary Access (TA) Road 7375-M1b (Alternative 3 only)

- 1. This proposed road exists ONLY under Alternative 3 and is a WRPM intended to eliminate concerns related to the placement and removal of the miner proposed temporary bridge to access Bull Run site 2.

Creation and use of the proposed TA road would be required to access this site which is located inside the RHCA. Therefore, it could not be moved out of the RHCA without eliminating site access.

2. Under Alternative 2, this road does not exist. Under Alternative 3, this proposed TA road would be in compliance with MM-2 as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity or channel morphology because the road would not be in the stream and not along the stream bank. Therefore, there would be no loss of bank stability and change in width/depth ratio.
 - c) New detrimental soil disturbance but the road would still be in compliance with MM-2 because this alternative adds Forest Service General Requirement Z1-14 and R13 (Appendix 2). These requirements ensure that roads will be located with FS input and appropriate soil and water resource protection measures identified and implemented. These resource protection measures include closing, obliterating and revegetating roads once they are no longer required to the mining activity.
 - d) None or only very minimal impacts to riparian or wetland vegetation if the selected route crosses any seeps for the same reasons noted in 2c.

3. **Alternative 2**

Road does not exist under this alternative. Therefore, no potential for a discharge into Bull Run Creek.

Alternative 3

No potential for a discharge because the addition of General Requirements Z1-13 (Appendix 2) is part of this alternative. These General Requirements require that the proposed road be located with input from the Forest Service and appropriate protection measures implemented. These resource protection measures also include closing, obliterating and revegetating roads once they are no longer required to the mining activity (General Requirement R-13, Z-14(Appendix 2).

4. Conclusions vary as a function of alternatives. The Forest Service General Requirements are added to Alternative 3 and these requirements bring the proposed mine access roads into compliance with respect to MM-2 by a) eliminating the potential for a discharge (water quality), b) minimizing the amount of road construction and new soil disturbance, and c) ensuring that roads would be reclaimed once no longer needed for mining activity (General Requirement R-13, Z-14, Appendix 2).

Bridge-specific Conclusions

Existing bridge

1. The existing bridge is a structure that is designed to cross a creek and decrease impacts to the stream banks and channel bed. Therefore, it cannot be moved outside the RHCA because to do so would place it in an area where a bridge is not necessary. While use of the bridge is not required to access mining site 1 and the processing site with an ATV, use of the bridge by the miner would decrease how often the existing ford would be used and thus decrease potential impacts on fisheries (*See Chapter 3, Fisheries Section*).
2. Use of the bridge inside the RHCA would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the bridge is not in the stream.
 - c) No impacts to channel morphology because the bridge is existing, stable and spans the creek. Therefore, there would be no new impacts to stream banks and no change to width/depth ratios.
 - d) No new soil disturbance because the bridge is existing.
 - e) No impact to the riparian vegetation because the bridge is existing.
3. No potential for a discharge from use of the bridge because it is existing and stable and no modifications are planned.
4. Conclusions are the same regardless of alternative.

Proposed Temporary Bridge (Alternative 2 only)

1. Use of the proposed temporary bridge would be required to cross Bull Run Creek access Bull Run site #2. Therefore, it could not be moved out of the RHCA.
2. Under Alternative 2, the proposed bridge would NOT be in compliance with MM-2 as it pertains to streams or activity inside the RHCA because
 - a) Potential impact to water quality over the short-term during bridge placement and removal for the reasons listed in #3 below.
 - b) No impact to inchannel complexity because the bridge would span the creek.

- c) No impact to channel morphology despite some bank disturbance related to bridge installment and removal because there would be no loss of bank stability or change in width/depth ratio.
 - d) Potential for some minor soil disturbance during placement and removal.
 - e) Potential for some minor impacts to the riparian vegetation because the bridge would be located in an area with riparian vegetation.
3. Under Alternative 2, potential for a discharge into Bull Run Creek due the disturbance of the stream banks could input of sediment into the creek when the bridge is installed and removed.

Under Alternative 3, discharge potential **would be eliminated** because of the addition of a Forest Service site-specific WRPM. The WRPM replaces the proposed bridge with a temporary access road 7375-M1b (evaluated below). This road would be located with input from the Forest Service and have the same Forest Service General Requirements as mentioned above for the proposed TA roads. Under this alternative, potential soil disturbance at the bridge location and impact to riparian vegetation would also be eliminated.

4. Conclusions vary as a function of alternatives. The Forest Service WRPM and General Requirements related to roads are added to Alternative 3. These requirements eliminate the concerns related to the proposed bridge.

Blue Smoke (Placer)

Sites (3 mining area and 1 processing area) visited by the district hydrologist on September 25, 2012 (Field book 9)

Structures related to the Blue Smoke operation that were evaluated for compliance with MM-2 are 1) an existing source water pond, 2) an existing settling pond and 3) an existing temporary access road (TA road 1000-E1a).

Plan information

Processing site is located approximately in the middle of the project next to Pond #2 and a short access rd. Pond #2 will be used for fresh supply water to feed the processor and the existing depression will be utilized as main settling pond by increasing both depth and width to about double in size, pond #3 will be used as back up overflow pond to ensure no sediment would discharge into Granite Creek. Both will be monitored constantly to ensure that does not

happen. A silt fence will be installed between settling pond and overflow pond to decrease sediment (p. 3).

Source of processing water = Groundwater. The dredge ponds are separated from Granite Creek by County Road 24 and there is no surface connection between the ponds and the creek.

Field observations

Granite Creek is a perennial and fish-bearing stream. RHCA = 300 ft/side. Valley bottom is less than 300 feet and is operation occurs on a site bounded by County Road 24 and a hillslope.

Pond-specific information

Ponds are existing old dredge ponds and are inside the RHCA of Granite Creek. The ponds are located on the west side of Granite Creek and separated from Granite Creek by County Road 24. The ponds are between County Road 24 and the power line road which runs along the west hillslope. There are multiple old dredge ponds in this zone but only two will be used. They are identified in the Plan Sketch as Pond 2 (source water pond) and Pond 3 (settling pond).

Field observations by the district hydrologist found that water at Pond 2 (source water pond) is moving through the fill of County Road 24 and reemerging on the east side of the County Road as flowing water. This water makes it to Granite Creek. Pond 3 (settling pond) also has water moving through the road fill but much less volume, and the only indication of water movement is the presence of horsetail up on the fill on the east side of the County Road. No indication of water emerging as flowing water.

Ponds are highly stable, existing and the distance between Granite Creek west to the hillslope is less than 300 feet.

Road-specific information

Temporary access road 1000-E1a is proposed for use. The road is inside the RHCA and a native surface road. It is stable and separated from Granite Creek by a fill slope, small floodplains around the old dredge ponds and County Road 24. Road length = 0.46 miles.

Pond-specific Conclusions

1. The source water pond and the settling pond should not be moved outside the RHCA for the following reasons. The ponds are old dredge ponds and if moved outside the RHCA the ponds would be on the hillslope because the valley bottom width in the area of the ponds is less than 300 feet. Hillslope ponds would be new construction and therefore new disturbance. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing ponds are on flat ground, a highly stable location, dug into the ground and supplied by groundwater.

2. Use of the existing source water and settling ponds would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impact water quality for the reasons listed in #3 below.
 - b) No impact inchannel complexity because the ponds are not in the channel.
 - c) No impact to channel morphology because the ponds are existing and separated from Granite Creek by County Road 24. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) No new soil disturbance because the ponds are existing.
 - e) No impact to the riparian vegetation along Granite Creek because the ponds are separated from Granite Creek by County Road 24. In addition, there would be no impact to the riparian vegetation that has developed around the old dredge ponds because only processing water will be discharged into the ponds. There is no activity proposed in the riparian area around the dredge ponds that would alter vegetation.
3. *Source water pond*

No potential for a discharge via surface flow from the source water pond into Granite Creek under either alternative because only withdrawing water.

Settling ponds

No potential for a discharge via surface flow from the settling pond into Granite Creek under either alternative because the proposed settling pond is an old dredge pond and capable of receiving volumes of water much greater than proposed by the operation and is separated from Granite Creek by County Road 24.

No potential for a discharge via subsurface flow from the settling pond under either alternative because the County Road 24 road fill, in the vicinity of Blue Smoke, has limited permeability. The only indication that some water is seeping through the road fill is a shift in vegetation type on the fill slope adjacent to Granite Creek. However, no signs of erosion were observed on the fill slope in this area.

4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. The road is an existing temporary access road (also referred to as the powerline road) and use of this road is required in order to access the site which is inside the RHCA. Therefore it cannot be moved out of the RHCA.

2. Use of the road would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impact to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology because the road is not in the stream and separated from Granite Creek by County Road 24 and the old dredge ponds. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because the road is existing.
 - d) No impact to the riparian vegetation along Granite Creek because the road is separated from Granite Creek by County Road 24. In addition, there would be no impact to the riparian vegetation that has developed around the old dredge ponds because the road is located along the base of the hillslope and above the ponds and riparian areas surrounding the ponds.
3. No potential for a discharge into Granite Creek from use of this road because the road is stable and separated from Granite Creek by a fill slope, small floodplains around the old dredge ponds and County Road 24.
4. Conclusions are the same regardless of alternative.

Bunch Bucket (Placer)

Sites (2 mining and 1 processing) visited by the district hydrologist on September 24, 2012 (Field book 8).

Structures related to the Bunch Bucket operation that were evaluated for compliance with MM-2 are the existing temporary access roads.

Plan information

The test hole/pond will have its volume expanded by deepening and grading the sides to a more gradual incline to secure a more dependable water supply (p.3).

Pond size will be approximately 30' x 60' and up to 10' deep (p. 5).

Source of processing water = is unknown. The miner in his plan states that he plans to use the pond, but the pond is dry so actual source of water is unknown.

Field observations

Clear Creek is perennial and fish bearing. RHCA = 300 ft/side. Valley bottom width is more than 300 feet on the side that the activity is proposed.

Pond-specific information

The Bunch Bucket existing pond is just outside the RHCA of Clear Creek. RHCA = 300 ft/side. The pond was dry at time of visit. Pond would be used for both as a source water pond and as a settling pond.

Road-specific information

Miner proposes to use three existing temporary access roads (Appendix 6). The roads are within the RHCA of Clear Creek. They are more than 100 feet from Clear Creek and separated from the creek by flat, well-vegetated ground. Road lengths are as follows: 1310-E2a = 0.08 miles (422 feet); 1310-E2b = 0.09 miles (475 feet); 1310-E2c = 0.08 miles (422 feet).

Pond-specific Conclusions

1. The pond is outside the RHCA.
2. N/A. The existing pond is outside the RHCA.
3. *Source water pond*

No potential for a discharge via surface or subsurface flow from the settling pond into Clear Creek but only withdrawing water.

Settling pond

No potential for a discharge via surface or subsurface flow from the settling pond into Clear Creek because pond is 1) more than 300 feet from the creek, 2) the ground is flat, and 3) the ground vegetation is 100 percent and very lush.

4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. Use of the existing temporary access (TA) roads is required in order to access the sites which are inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Use of the existing TA roads would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impact to water quality for the reasons listed in #3 below.

- b) No impacts to inchannel complexity or channel morphology because the roads are not in the stream and are separated from Clear Creek by more than 100 feet. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because the roads are existing.
 - d) No impact to the riparian vegetation because the roads are separated from Clear Creek by more than 100 feet.
3. No potential for a discharge into Clear Creek from use of these roads because the roads are stable and separated from Clear Creek by more than 100 feet of flat, well vegetated ground that would effectively any sediment that left the roads.
4. Conclusions are the same regardless of alternative.

City Limits (Placer)

Sites (1 mining and 1 processing) were visited by the district hydrologist on September 18, 2012 (Field book 7).

Structures related to the City Limits operation that were evaluated for compliance with MM-2 are 1) an existing source water pond, 2) existing settling ponds and 3) two existing temporary access roads.

Plan information

Process water will be constantly recycled in the off-channel settling ponds which are separated from Granite Creek by the rock tailings area and by the paved highway. Brush and cat tails around the pond will be protected (p. 5).

Source of processing water = Groundwater. No surface connection between ponds and Granite Creek.

Field observations

Granite Creek is perennial and fish-bearing. RHCA = 300 ft/side. Valley width on the east side of Granite Creek is less than 300 feet and bounded by Highway 73 and a hillslope.

Pond-specific information

The source water pond and the settling ponds are existing old dredge ponds and located inside the RHCA. They are dug into the ground and are stable. Ponds are separated from Granite Creek by the 7300 road and old placer tailings.

Road-specific information

Miner proposes to use two existing temporary access (TA) roads with road beds composed of old tailings (Appendix 6). The roads are within the RHCA. They are more than 100 feet from the creek and separated from the creek by highway 7300 and old dredge ponds. The ponds are located on flat ground and there is sufficient ground to trap any sediment that is generated by road use and prevent it from reaching the creek. Road lengths are as follows: 7300-E3a = 0.11 miles; 7300-E3b = 0.02 miles.

Pond-specific Conclusions

1. The source water and the settling ponds should not be moved outside the RHCA for the following reasons. The ponds are old dredge ponds and if moved outside the RHCA the ponds would be on the hillslope because the valley bottom width in the area of the ponds is less than 300 feet. Hillslope ponds would be new construction and therefore new disturbance. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing ponds are on flat ground, a highly stable location, dug into the ground and supplied by groundwater.
2. Use of the source water pond and the settling ponds would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because:
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the ponds are not in the channel.
 - c) No impact to channel morphology because the ponds are existing and separated from Granite Creek by FS 7300 road and old dredge tailings. Therefore, there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) No new soil disturbance because the ponds are existing.
 - e) No impact to the riparian vegetation because the ponds are existing and separated from Granite Creek by FS 7300 and old dredge tailings. In addition, no impact to the riparian vegetation that has developed around some of the old dredge ponds because no activity is proposed in the riparian area around the dredge ponds that would alter vegetation.

3. *Source water pond*

No potential for a discharge via surface flow from the source water pond into Granite Creek because would only be withdrawing water.

Settling ponds

No potential for a discharge via surface flow from the settling ponds into Granite Creek because the ponds 1) are old dredge ponds and capable of receiving volumes of water much greater than that proposed by the operation and 2) are separated from Granite Creek by the 7300 road and other old placer tailings.

No potential for a discharge via subsurface flow from the settling pond because 1) the 7300 road fill has limited permeability and 2) the pond bottoms are covered in silt. This indicates that the ponds have sealed and are not moving fine sediment through the subsurface.

4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. Use of these existing roads is required in order to access the site. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Use of the existing temporary access roads (TAs) would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because:
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology because the roads are not in the stream and separated from Granite Creek by FS 7300 and old dredge tailings. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because the TA roads are existing.
 - d) No impact to the riparian vegetation along Granite Creek because the roads are separated from the creek by FS 7300. In addition, no impacts to the riparian vegetation that has developed around some of the old dredge ponds because the roads are located along the base of the hillslope and no new road activity is proposed for the riparian areas.
3. No potential for a discharge into Granite Creek as a result of road use because 1) minimal sediment is expected to be generated because the road beds are old tailings and 2) there is sufficient ground cover to trap and prevent any sediment that might be generated by road use from reaching the creek.
4. Conclusions are the same regardless of alternative.

East Ten Cent Creek (Placer)

Site visited by the district hydrologist on August 25, 2010 (Field book 5) and on September 19, 2012 (Field book 7).

Structures related to the East Ten Cent Creek operation that were evaluated for compliance with MM-2 are 1) an existing source water pond, 2) existing settling pond, 2) one closed Forest Service road (7350-050), 3) two existing temporary access roads, and 4) one existing bridge. Forest Service closed road 7350-070 is also proposed for use but is outside the RHCA and therefore not discussed further.

Plan information

The existing holding pond (@12 ft diameter) will be used to provide water for the operation and to act as a holding/settling pond (p.4).

Source of processing water = Groundwater. Ponds are elevationally above East Ten Cent Creek and there is no surface connection between the ponds and the creek.

Field observations

East Ten Cent Creek has intermittent flow but is thought to be seasonally fish-bearing. RHCA = 300 ft/side. Valley bottom width at the mining and processing areas is less than 100 feet. The valley bottom in this area is bounded by the creek and the hillslope.

Pond-specific information

The two existing ponds are located inside the RHCA but only one pond is proposed for use. This pond would serve as both a source water pond and a settling pond.

The pond is elevationally above East Ten Cent Creek, on a terrace created by mine tailings, separated from the creek by at least 25 feet, and in a stable location. The pond has silt and vegetation on the pond beds and thus is well sealed. The pond appears to hold water year round indicating that some groundwater is entering the pond. The slope of the terrace that borders the creek is composed of cobbles and fines and at the base of the slope there is a narrow, well vegetated flat area before reaching the creek. No seepage zones were noted in the terrace slope bordering the stream and none are expected as a result of the operation.

Road-specific information

Miner proposes to use two closed Forest Service roads and two existing temporary access (TA) roads (Appendix 6). The Forest Service roads and one of the TA roads have an aggregate surface. The other TA road is a native surface road.

Closed Forest Service road 7350-070 is outside the RHCA of East Ten Cent Creek and is not discussed further.

The remaining three roads are within the RHCA and evaluated for compliance with MM-2. The roads are separated from the creek either dense vegetation and/or old mine tailings. Road lengths are: FS closed road 7350-050 = 0.06 miles; TA road 7350-E1a = 0.12 miles; TA road 7350-M1a = 0.32 miles.

Bridge-specific information

Miner proposes to use an existing foot bridge that crosses East Three Cent Creek. The bridge is inside the RHCA of Clear Creek. The bridge would be used for foot traffic only.

Pond-specific Conclusions

1. The source water/settling pond should not be moved outside the RHCA for the following reasons. The pond is old mining ponds and if moved outside the RHCA the pond would be on the hillslope because the valley bottom width in the area of the ponds is less than 300 feet. A hillslope pond would be new construction and therefore new disturbance. The hillslope soils are shallow and the pond would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing pond is on flat ground, a highly stable location, dug into the ground and supplied by groundwater.
2. Use of the existing pond as a source water and as a settling pond would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the ponds are not in the channel.
 - c) No impacts to channel morphology because the ponds are existing, at least 25 feet from East Ten Cent Creek, and above the creek. Therefore, there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) No new soil disturbance because the ponds are existing.
 - e) No impact to the riparian vegetation because the ponds are at least 25 feet from the creek as well as above the creek on a terrace. Therefore, there would be no impact to the riparian vegetation along the creek. In addition, no impacts to the riparian vegetation that has developed around the old dredge ponds because no activity is proposed in the riparian area around the dredge ponds that would alter vegetation.

3. Source water pond

No potential for a discharge via surface flow from the source water pond into the creek because would only be withdrawing water.

Settling pond

No potential for a discharge via surface flow from the settling pond into East Ten Cent Creek because the pond is an old dredge pond and a berm exists between the creek and the pond which would effectively trap any sediment that moved off site.

No potential for a discharge via subsurface flow from the settling pond because the pond is well-sealed with fines and vegetation. No changes are expected in the volume of water entering the pond during the operation.

4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. Use of these existing roads is required in order to access the site which is located inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Use of the one closed Forest Service road inside the RHCA and the two TA roads inside the RHCA would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the roads are not in the stream.
 - c) No impacts to channel morphology because the roads are existing and separated from the creek by more than 25 feet. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - d) No new soil disturbance because the roads are existing.
 - e) No impact to the riparian vegetation because the roads are existing and do not cross areas with riparian vegetation.
3. No potential for a discharge from use of any of the roads because they are all separated from the creek either dense vegetation and/or old mine tailings. Both are effective at trapping any sediment that is generated by road use and prevent it from reaching the creek. In addition, three of the existing roads proposed for use have an aggregate surface and the amount of sediment that could be generated as a result of use is minimal.

4. Conclusions are the same regardless of alternative.

Bridge-specific Conclusions

1. The existing bridge is a structure that is designed to cross a creek and decrease impacts to the stream banks and channel bed. Therefore, it cannot be moved outside the RHCA because to do so would place it in an area where a bridge is not necessary. While use of the bridge is not required to access the mining sites and the processing site, it would only be used by the miner to cross between the mining site and the cabin on foot. Use of the bridge by the miner would eliminate any impacts to stream banks and thus on fisheries (See *Chapter 3, Fisheries Section*).
2. Use of the foot bridge inside the RHCA would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the bridge is not in the stream.
 - c) No impacts to channel morphology because the bridge is existing and spans the creek. Therefore, there would be no new impacts to stream banks and no change to width/depth ratios.
 - d) No new soil disturbance because the bridge is existing.
 - e) No impact to the riparian vegetation because the bridge is existing.
3. No potential for a discharge from use of the foot bridge because it is existing, stable, and no modifications are planned.
4. Conclusions are the same regardless of alternative.

Eddy Shipman (Lode/Placer)

East site (lode adit) visited by the district hydrologist on October 21, 2004 (Field book 3) and west sites on June 24, 2013 (Field book 11).

Structures related to the Eddy Shipman operation that were evaluated for compliance with MM-2 are 1) proposed source water pond, 2) proposed settling ponds, 3) two closed FS roads, and 4) four existing temporary access roads. The proposed ponds would be used for both lode processing and placer processing.

Plan information

Lode portion: Water from wells at the Buffalo enters Chipman Gulch, and this water is used for milling. Existing ponds will contain process water (p. 7).

Placer portion: Process water is pumped from Chipman Gulch or taken from off channel ponds. This water is recycled in the existing ponds. The main pond has been in place for many years and is well sealed. Two more small ponds also exist (p.7).

Source of processing water = Chipman Gulch

Field observations

Granite Creek is perennial and fish-bearing. RHCA = 300 ft/side. Chipman Gulch is perennial but non fish-bearing as a result of a fish barrier at the confluence of Chipman Gulch and Granite Creek. Therefore, Chipman Gulch is considered perennial and non-fish bearing and has an RHCA of 150dft/side.

Pond-specific information

The Eddy-Shipman ponds are ponds created by old placer tailings. They are located inside the RHCA of Granite Creek and Chipman Gulch. The ponds are within about 60 feet from the creek and separated from the creek by a flat, densely vegetated wet meadow. The ponds would be used for the lode and placer portions of the operations.

Road-specific information

Miner proposes to use two closed Forest Service roads and four existing temporary access roads (Appendix 6). These six roads are within the RHCA of Granite Creek and/or Chipman Gulch.

West Side Access

Forest Service closed road 7300-590, and existing temporary access roads 7300-E1a and 7300-E1b are used to access the sites west of Forest Service 7300. Forest Service 7300-590 crosses Granite Creek via a culvert and E1a and E1b are on flat ground and are separated from the creek by dense wetland/wet meadow vegetation and/or tailings. Road lengths are: 7300-590 = 0.04 miles; 7300-E1a = 0.42 miles; 7300-E1b = 0.1 miles;

East Side Access

Forest Service closed road 7300-680 and existing temporary access road 7300-E1d are used to access the adit east of the Forest Service 7300 highway and are connected via a ford crossing. Both roads slope towards Granite Creek and are composed of a mix of fines and coarser material. Road lengths are: 7300-680 = 0.1 miles; 7300-E1d = 0.07 miles.

Pond-specific Conclusions

1. The same proposed ponds would be used for both lode mining and placer mining. They cannot be moved out of the RHCA for the following reasons. If the proposed ponds were moved out of the RHCA, they would be on a hillslope because the valley bottom width between the creek and the hillslope in the area of the proposed ponds is less than 300 feet. There are some old tailings along the base of the hillslope from past lode mining that may be high in heavy metals. The hillslope soil depths are shallow and groundwater inputs into the ponds are expected to be limited. If the ponds filled (e.g. in the spring) there would be the potential for a pond failure and hillslope and tailings erosion. Sediment would enter Granite Creek via surface erosion.
2. Use the existing depressions as the source water and settling ponds would NOT be in compliance with MM-2 under Alternative 2 because
 - a) Potential impact to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because no activity in the creek or gulch.
 - c) No impacts to channel morphology because ponds are existing and not on the stream bank.
 - d) No new soil disturbance because ponds are existing
 - e) No impact to riparian vegetation because ponds are existing and the vegetation in the dry ponds is upland vegetation.

3. *Source water pond*

Potential discharge under Alternative 2 because the lower portion of the pond is not sufficient bermed to prevent water from entering the wet meadow.

Under Alternative 3, discharge potential **would be eliminated** as a result of the addition of a Forest Service WRPM which would require that the source water pond be bermed to keep pond water from entering the wet meadow via surface flow.

Settling ponds

Under Alternative 2, there would be a potential for a discharge via surface and subsurface flow of sediment and heavy metals into Granite Creek because the lower portion of the pond is not sufficient bermed to prevent water from entering the wet meadow.

Under Alternative 3, discharge potential **would be eliminated** as a result of the addition for a Forest Service WRPM and General Requirements L3, L4, and L5. The WRPM would require that the settling pond be sufficient bermed to prevent water and sediment from entering into the

wet meadow. Forest Service General Requirements L3, L4, and L5 would address concerns related to the potential for inputs of heavy metals

4. Conclusions vary as a function of alternatives. The Forest Service WRPM and General Requirements added to Alternative 3 bring the settling pond into compliance with MM-2 by eliminating the potential for a discharge.

Road-specific Conclusions

West Side Access

1. Use of Forest Service closed road 7300-590, and existing TA roads 7300-E1a and 7300-E1b are required to access sites west of Forest Service road 7300, which are inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Use of Forest Service closed road 7300-590, and existing TA roads 7300-E1a and 7300-E1b would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the roads are not in the stream.
 - c) No impacts to channel morphology because the roads are existing and are separated from the creek by tailings and distance. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - d) No new soil disturbance because they are existing roads.
 - e) No impact to the riparian vegetation for the same reasons noted for 2c.
3. No potential for a discharge from use of any of the roads under either alternative because Forest Service 7300-590 crosses Granite Creek via a culvert and E1a and E1b are on flat ground and are separated from the creek by dense wetland/wet meadow vegetation and/or tailings. Vegetation and tailings are effective at trapping any sediment that is generated by road use and would prevent it from reaching the creek.

4. Conclusions are the same regardless of alternative.

East side Access

1. Use of Forest Service closed road 7300-680 and existing TA road 7300-E1d are required to access the lode on the east side of Forest Service 7300 which is located inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.

2. Under Alternative 2, use of these two roads would NOT be in compliance with MM-2 as it pertains to streams because
 - a) Potential to impact water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the roads are existing and not in the stream except at the designated ford. Therefore, there would be no new impacts to stream banks and no change to width/depth ratios.

However, use of these two roads would be in compliance with MM-2 as it pertains to activity inside the RHCA

- c) No new soil disturbance because they are existing roads.
- d) No impact to the riparian vegetation because they are existing roads and they don't cross any seeps or wetlands.

Under Alternative 3, use of these roads **would be in compliance** with MM-2 for the reasons listed in #3 below.

3. Under Alternative 2, potential for a discharge because both roads slope towards Granite Creek and are composed of a mix of fines and coarser material. Sediment would enter the creeks as a result of road use which would locally alter water clarity.

Under Alternative 3, discharge potential **would be eliminated** as a result of the addition of a Forest Service site-specific WRPM. This WRPM requires that the ford approaches to the creek be rocked, thereby removing the sediment source.

4. Conclusions vary as a function of alternatives. The Forest Service WRPMs are added to Alternative 3 and these WRPMs bring use of the proposed mine access roads into compliance with respect to MM-2 by eliminating the potential for a discharge.

Grubsteak (Placer)

Operation has two mining areas and one processing site. Sites visited by the district hydrologist on October 4, 2010 (Field book) and September 19, 2012 (Field book 7).

Structures related to the Grubsteak operation that were evaluated for compliance with MM-2 are 1) one existing pond which serves as both source water and settling pond, 2) several proposed ponds, 3) one existing TA road, and 4) an existing bridge.

Plan information

Water for the operation will be pumped from the off channel pond....Small settling/recycling ponds (at least 10'x 10' x 4' deep) will be used to control muddy water (p. 7)

Source of processing water = Groundwater. The pond is distant from Clear Creek and there is no surface connection between the pond and the creek.

Field observations

Clear Creek is a perennial and fish-bearing stream. RHCA = 300 ft/side. The existing pond is both the source water pond and the settling pond. It is located inside the RHCA.

Pond-specific information

The existing Grubsteak pond is located at Site A and inside the RHCA of Clear Creek. The pond was estimated at about 15' deep from lip to bottom and is similar about 20' x 30'. The ground between the creek and the pond is mostly flat. Ground cover is 100% and there is a lot of downed wood.

The pond at site A is both a source water pond and the settling pond. The pond is dug into fine-grained sediments.

The location and number of the proposed small settling ponds has not been identified. They are also expected to be located inside the RHCA of Clear Creek. Valley width between Clear Creek and the existing processing pond is 240 feet from the creek.

Road-specific information

Miner proposes to use one existing native surface temporary access road (Appendix 6). The road is inside the RHCA of Clear Creek. The access road is across flat ground and at least 50 feet from the creek except where in the vicinity of where it crosses the creek at the designated ford. The ground between the road and the creek is well vegetated with grasses, needles and forbs.

Bridge-specific information

Miner proposes to use an existing wooden bridge which crosses Clear Creek, a perennial, fish-bearing stream. The bridge is inside the RHCA. The bridge is also adjacent to an existing ford. However, given the size and structure of the bridge, it can only handle regular vehicle or ATV traffic. The ford use would be limited to moving heavy equipment. Use of the bridge and ford combination would reduce the number of ford crossings and thus potential impacts to fish (See *Fisheries Section* for discussion of impacts of ford use on fisheries).

Pond-specific Conclusions

Existing pond at Site A

1. The existing source water/settling pond should not be moved outside the RHCA for the following reasons. If the pond is moved outside the RHCA the pond would be on the hillslope because the valley bottom width in the area of the ponds is less than 300 feet. Hillslope pond would be new construction and therefore new disturbance. The hillslope soils are shallow and the pond would receive limited groundwater inputs. When filled (e.g. in the

spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing pond is on flat ground, in a highly stable location, dug into the ground and supplied by groundwater

2. Use of the existing source water/settling pond would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity because the ponds are not in the channel.
 - c) No impact to channel morphology because the pond is existing and separated from Clear Creek by about 240 feet of flat, vegetated ground. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) No new soil disturbance because the pond is existing.
 - e) No impact to the riparian vegetation because the pond is separated from Clear Creek by about 240 feet of flat vegetated ground. No riparian vegetation has developed in the area of the existing pond.

3. *Source Water Pond*

No potential for a discharge via surface or subsurface flow when pond at Site A used as a source water pond because only withdrawing water.

Settling ponds

No potential for a discharge via surface or subsurface flow under either alternative when the existing pond at Site A is used as a settling pond because 1) there is good ground cover between the pond and the creek which would effectively trap any sediment that left the pond, 2) the pond is more than 200 feet from the creek and the sediments between the pond and the creek are a mix of coarse and fine sediments resulting in low permeability. Therefore, use of the existing pond is not expected to create seepage zones along the Clear Creek stream bank or transport sediment via the subsurface to the creek.

4. Conclusions are the same regardless of alternative.

Proposed Ponds

1. The proposed settling ponds should not be moved outside the RHCA for the same reasons noted above for the existing source water/settling pond at site A.

2. Use of the proposed settling ponds **could not be evaluated** for compliance with MM-2 under Alternative 2 because no location was provided by the miner.

However, under Alternative 3, these ponds **would be in compliance** with MM-2 for the because

- a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology because of the addition of FS WRPM which requires that the ponds be located with FS input and protection measures identified and implemented.
 - c) While there would be some new soil disturbance, the new disturbance would be keep to a minimum with the addition of one Forest Service WRPM and General Requirement R-15. The WRPM requires that the ponds be located with Forest Service input and protection measures identified and implemented. The General Requirement requires that the pond be reclaimed when mining was completed.
 - d) No impacts to any riparian vegetation because the ponds would be located in areas where no riparian vegetation exists as per the additional Forest Service WRPM.
3. Under Alternative 2, the potential for discharge **could not be evaluated** because the pond locations had not been identified by the miner.

Under Alternative 3, no potential for a discharge via surface or subsurface flow from the proposed ponds because the addition of Forest Service site-specific WRPMs. This WRPM would require that the miner locate these ponds with input from the Forest Service and the appropriate protection measures identified and implemented.

4. Conclusions vary as a function of alternatives. The Forest Service WRPM and General Requirement are added to Alternative 3 and these protection measures bring the proposed settling ponds into compliance with respect to MM-2 by eliminating the potential for a discharge, minimizing the amount of soil disturbance, and ensuring reclamation upon completion of mining.

Road-specific Conclusions

1. Use of the existing temporary access (TA) road is required in order to access the site which is located inside the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.
2. Use of the existing TA road would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because

- a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology because the road is not near the stream, except at the designated ford. Therefore, there would be no new impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because the road is existing.
 - d) No impact to the riparian vegetation because the road is not near any riparian vegetation except near the stream where it crosses at the designated ford.
3. No potential for a discharge from use of the road under either alternative because it is located on flat ground and in the forest except for the area just after it crosses the creek. There is good ground cover between the road and the creek. Gentle topography and good ground cover are effective at trapping any sediment that is generated by road use and would prevent it from reaching the creek.
4. Conclusions are the same regardless of alternative.

Bridge-specific Conclusions

1. The existing bridge is a structure that is designed to cross a creek and decrease impacts to the stream banks and channel bed. Therefore, it cannot be moved outside the RHCA because to do so would place it in an area where a bridge is not necessary. While use of the bridge is not required to access the mining sites and the processing site because there is an adjacent existing ford, use of the bridge by the miner would decrease how often the existing ford would be used and thus decrease potential impacts on fisheries (*See Chapter 3, Fisheries Section*).
2. Use of the bridge inside the RHCA would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
- a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the bridge is not in the stream.
 - c) No impacts to channel morphology because the bridge is existing, stable and spans the creek. Therefore, there would be no new impacts to stream banks and no change to width/depth ratios.
 - d) No new soil disturbance because the bridge is existing.
 - e) No impact to the riparian vegetation because the bridge is existing.

3. No potential for a discharge from use of the bridge because it is existing and stable and no modifications are planned.
4. Conclusions are the same regardless of alternative.

Hopeful 1 (Placer)

Sites visited by the district hydrologist on September 24, 2010 (Field book 5). Operation has one mining area and one processing area. They are located in the same place.

Structures related to the Hopeful 1 operation that were evaluated for compliance with MM-2 are 1) an existing source water pond, 2) an existing settling pond, 3) one Forest Service closed road and 4) one existing temporary access road.

Plan information

A ½ hp pump will be used to pump water from Granite Creek and wash water will drain into nearby dredge hole (p. 4).

The water from an existing dredge hole near the cabin or the dig site is used to wash the tailings in the spring when creek levels are high/late in the season water is pumped from the creek. The waste water is put into depression in the dredge tailings (p. 6)

Source of processing water = Granite Creek and old dredge hole. There is no surface connection between the dredge hole and Granite Creek.

Field observations

Granite Creek is perennial and fish bearing. RHCA = 300 ft/side. Valley width on the north side of Granite Creek is less than 100 feet and bounded by the creek and a hillslope.

Pond-specific information

There are two ponds, a source water pond and a settling pond. The ponds are between 50 to 100 feet from the creek and located inside the RHCA of Granite Creek.

The source water pond is an old existing dredge hole. Water for the source water pond comes from spring melt. It had water in it at time of visit. Miner proposes to pump water from the stream later in the season when the pond goes dry. Ground is flat and pond is dug into the ground.

The settling pond is located behind a berm of old placer tailings 8 to 10 feet tall, estimated from the creek bed to the top of the berm. The settling pond is a depression in the dredge tailings. This depression is also located behind the old placer tailings berm.

Road-specific information

Miner proposes to use one closed Forest Service road and one existing temporary access road (1035-E2a) (Appendix 6). The roads are inside the RHCA of Granite Creek. The roads have an aggregate surface. Forest Service road 1035-012 is separated from the creek by more than 100 feet of forested ground. Forest Service road 1035-E2a is separated from the creek by at least 100 feet of ground that is well vegetated with grasses and forbs. Road lengths are: FS 1035-012 = 0.7 miles; TA road 1035-E2a = 0.17 miles.

Pond-specific Conclusions

1. The source water pond and the settling pond should not be moved outside the RHCA for the following reasons. If ponds were moved outside the RHCA the ponds would be on the hillslope because the valley bottom width in the area of the ponds is less than 100 feet. Hillslope ponds would be new construction and therefore new disturbance. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing ponds are dug into flat ground, which is a highly stable location, and receive some groundwater.
2. Use of the existing source water pond and the settling pond would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity because the existing ponds are not in the channel.
 - c) No impact to channel morphology because the existing ponds are on a terrace and separated from Granite Creek by at least 50 feet. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) No new soil disturbance because the ponds are existing.
 - e) No impact to the riparian vegetation because the ponds are in an area that do not have riparian vegetation. They are at least 50 feet back from the creek and up on a terrace. In addition, there would be no impacts to the riparian vegetation that has developed in the ponds because only processing water will be discharged into the ponds.

3. *Source water pond*

No potential for a discharge from use of the source water pond into Granite Creek under either alternative because would only be withdrawing water.

Settling pond

No potential for a discharge via surface flow from the settling pond into Granite Creek under either alternative because the ponds are old dredge ponds, are up on a terrace and separated from the creek by an 8 to 10 foot high berm of old placer tailings.

No potential for a discharge via subsurface flow from the settling pond to the creek under either alternative because the pond bottoms are vegetated with lush rushes, sedges and brush which indicate that the ponds are effectively trapping any fine sediment that enters them.

4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. Use of these existing roads is required in order to access the site which is located inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Use of the closed Forest Service road and the existing TA road would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology because the roads are not in the stream and separated from Granite Creek by about 100 feet of forested ground. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because the roads are existing.
 - d) No impact to the riparian vegetation because the roads are existing and are separated from Granite Creek by about 100 feet. In addition, there would be no impact to the riparian vegetation that has developed in the two ponds because the roads do not enter the ponds.
3. No potential for a discharge from use of either road because 1) Forest Service road 1035-012 is separated from the creek by more than 100 feet of forested ground and 2) existing TA road 1035-E2a is separated from the creek by at least 100 feet of ground that is well vegetated with grasses and forbs. The ground cover and distance are effective at trapping any sediment that is generated by road use and prevent it from reaching the creek. In addition, both roads have an aggregate surface which limits the amount of fines that would be generated as a result of use.
4. Conclusions are the same regardless of alternative.

Hopeful 2 & 3 (Placer)

Sites were visited by the district hydrologist on September 24, 2010 (Field book 5) and on June 24, 2013 (Field book 10).

Structures related to the Hopeful 2 & 3 operation that were evaluated for compliance with MM-2 are 1) construction and use of two proposed ponds on the north side of Granite Creek (*North processing site*), 2) one existing pond on the south side of Granite Creek (*South processing site*), and 3) four existing temporary access roads.

Plan information

All process water is contained in the ponds, and there would be no discharge of process water. Ponds on the south side of Granite Creek are approximately 20'x30'x4' in size (ponds were reclaimed on the north side of Granite Creek but the plan is to reconstruct them when mining takes place again in this location), and both processing sites are located over 50 feet from Granite Creek. These are pit type ponds without dams (p. 3).

The off-channel settling recycling ponds on both the north and south sides of the creek are sized at 20'x30'x4' and are located 50 feet from Granite Creek (p. 4).

Water from a spring on the south side of the creek provides water for each area and there is a pipeline that crosses the creek on the north side.... Additional water for processing placer gravels at the two processing sites comes from groundwater (p. 2).

Source of processing water = a spring on the south of the creek and groundwater.

Field observations

Granite Creek is perennial and fish bearing. RHCA = 300 ft/side. The Hopeful 2&3 has two processing sites, one proposed and one existing. The proposed processing site is located on the north side of the creek and the existing processing site is on the south side.

Pond-specific information

North processing site (2 proposed ponds)

The two proposed ponds on the north side would be located inside the RHCA. One would be used as a source water pond and one as a settling pond. They would be on a terrace and about 30 feet from the creek. There is good microtopography between the creek and proposed pond area and vegetation is lush grasses, forbs and rushes.

South processing site (one pond)

The existing south pond is inside the RHCA. It would be used as both a source water pond and as a settling pond. Valley width on the south side of Granite Creek in this area is less than 50 feet. The pond is adjacent to Granite Creek (within 10 feet) and elevationally above it. The pond was holding water at the time and the pond bed was covered with fines and has sedges all around the perimeter of the pond. The pond is well bermed with the berm more than 5 feet tall. The pond has a large capacity to hold water. The berm sediments are composed of fines and large gravels. The front of the berm, facing the stream, is composed of large cobbles and boulders and appears stable. There was no indication that water and sediment is making it through the berm. There is no surface connection between the pond and the creek.

Road-specific information

Miner proposes to use four existing temporary access (TA) roads (Appendix 6). Roads are inside the RHCA. Two of the mine access roads have an aggregate surface (1035-E1a and 1035-E1b). The other two mine access roads have a native surface (1035-E1c and 1035-E1d). All roads are separated from the creek by vegetated ground. Road lengths are: TA 1035-E1a = 0.21 miles, TA 1032-E1b = 0.08 miles; TA 1035-E1c = 0.27 miles; TA 1035-E1d = 0.19 miles.

Pond-specific ConclusionsNorth processing site (2 proposed ponds)

1. The proposed source water and settling ponds cannot be moved outside the RHCA for the following reasons. If moved outside the RHCA the ponds would be on the hillslope because the valley bottom width in the area is less than 200 feet. The hillslope soils are shallows and ponds would receive limited groundwater inputs.

2. Alternative 2

Pond construction of the source water and settling ponds and use of the settling pond would NOT be in compliance with MM-2 under Alternative 2 as it pertains to streams because

- a) Potential impact to water quality for the reasons listed in #3 below.
- b) No impact to inchannel complexity or channel morphology because the ponds are not in the channel.

However, construction and use of the two ponds would be in compliance under both alternatives as it pertains to activity inside the RHCA

- c) No new soil disturbance despite being new construction because they would be located in an area that has been previously disturbed.

- d) No impacts to riparian vegetation because the ponds are on a terrace and separated from Granite Creek by 30 feet. The terrace has upland vegetation.

Use of the source water pond would be in compliance with MM-2 because the miner would only be withdrawing water and there would be no impacts to streams or the RHCA.

Alternative 3

Pond construction of both ponds and use of the settling pond would now be in compliance with MM-2 as a result of the addition of Forest Service site-specific WRPMs for the reasons listed in #3 below.

Use of the source water pond would be in compliance for the reasons noted under Alternative 2.

3. Alternative 2

Potential for a discharge of sediment via surface flow during construction of both the source water and settling pond and use of the settling pond because the edge of the terrace is only 7 feet away and then it drops down to the active floodplain. In addition, there is a small swale at the edge of the terrace by the settling pond area that would funnel any surface water and sediment that left the settling pond during use onto the floodplain.

Use of the source water pond: No potential for a discharge because would only be withdrawing water.

Alternative 3

Potential for a discharge would be eliminated with the addition of Forest Service site-specific WRPMs (Appendix 1A). These WRPMs would ensure that effective sediment trapping mechanisms were in place during construction of the source water and settling ponds and during use of the settling pond to prevent sediment from leaving the terrace during construction and use.

Use of source water pond: Same as Alternative 2. No potential for a discharge.

- 4. Conclusions differ as a function of alternative. Forest Service site-specific WRPM are added to Alternative 3. These WRPMs eliminate the potential for a discharge of sediment during construction and use.

South processing site (one pond)

- 1. The existing source water/settling pond should not be moved outside the RHCA for the following reasons. If the existing pond was moved outside the RHCA the pond would be on

the hillslope because the valley bottom width in the area is less than 50 feet. Hillslope ponds would be new construction and therefore new disturbance. The hillslope soils are shallows and ponds would receive limited groundwater inputs. When filled in the spring there would be the potential for pond failure and hillslope erosion into Granite Creek. In contrast, the existing pond is on flat ground, in a highly stable location, dug into the ground and supplied by ground water.

2. Use of the existing source water/settling pond would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity because the pond is not in the channel.
 - c) No impact to channel morphology, under despite being only 10 feet from the creek, because the pond is separated from Granite Creek by a large stable berm that is composed of coarse sediment.
 - d) No new soil disturbance because the pond is existing.
 - e) No impacts to the riparian vegetation are expected even though the pond contains some riparian vegetation because the pond would only receive sediment.

3. *Source water pond*

No potential for a discharge via surface or subsurface flow from use of the pond as a source water pond because only withdrawing water.

Settling pond

No potential for a discharge via surface or subsurface flow from use of the pond as a settling pond under either alternative because the pond is well sealed and has a tall, well-constructed and stable berm that separates it from Granite Creek.

4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

Existing Temporary Access roads EXCEPT TA 1035-E1d

1. Use of these existing temporary access (TA) roads is required in order to access the sites which are inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.

2. Use of all existing TA roads, except 1035-E1d, would be in compliance with MM-2 under both alternatives because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology because the roads are not in the stream, except at the designated ford, and are separated from Granite Creek by vegetated ground. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because the roads are existing.
 - d) No impact to the riparian vegetation along Granite Creek because the roads are existing and are separated from Granite Creek and any riparian vegetation except in the vicinity of the designated ford.
3. No potential for a discharge from use of any of the roads under either alternative because they are separated from the creek by vegetated ground that would effectively trap any sediment that might leave the roads prior to it reaching the creek. In addition, two of the roads have an aggregate surface and sediment generated by use would be minimal.
4. Conclusions are the same regardless of alternative.

Existing Temporary Access road 1035-E1d

1. Use of this existing temporary access (TA) road is required in order to access mining site #4 and the south processing site which are inside the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.
2. Under Alternative 2, use of existing TA road 1035-E1d would NOT be in compliance with MM-2 as it pertains to streams because
 - a. Potential impacts to water quality for the reasons listed in #3 below.
 - b. No impacts to inchannel complexity or channel morphology because the roads are not in the stream, except at the designated ford, and are separated from Granite Creek by vegetated ground. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.

However, use would be in compliance with MM-2 as it pertains to activity inside the RHCA under both alternatives because:

- c. No new soil disturbance because the road is existing.

- d. No impact to the riparian vegetation along Granite Creek because the road is existing and separated from Granite Creek and any riparian vegetation except in the vicinity of the designated ford.

Under Alternative 3, road use **would be in compliance** with MM-w as it pertains to streams because discharge potential **would be eliminated** for reasons noted in #3 below.

3. Under Alternative 2, there would be the potential for a discharge of sediment during use of the road because it has a steep slope that feeds into the ford, is rutted and composed of easily eroded sediment (gruss).

Under Alternative 3, the discharge potential **would be eliminated** because of the addition of Forest Service WRPMs which would prevent any sediment that eroded from the road from reaching the creek. WRPMs vary depending on the segment of road and include rocking the road and putting in water bars in select areas on the road.

4. Conclusions vary as a function of alternative. Forest Service site-specific WRPMs are added to Alternative 3 for this road. These requirements would eliminate the potential for a discharge of sediment.

L & H (Placer and Lode)

Site was visited by the district hydrologist on October 15, 2004 (Field book 2) and October 26, 2004 (Field book 3) and by Allison Johnson (UNF fisheries biologist) on August 12, 2010.

Structures related to the L & H operation that were evaluated for compliance with MM-2 are two existing temporary access (TA) roads. The ponds are outside the RHCA and therefore not evaluated for compliance with MM-2.

Plan information

...a small washing plant set up near the three ponds in the draw. Water collects in these ponds during snowmelt and from seepage from the Rabbit portal and the Pete Mann Ditch.... The processing area is approximately 200 feet from a spring that runs off during snow melt but later seeps into the ground (p. 2).

Water for processing will come from three ponds which collect surface snow melt water and also ground water. These are approximately 8'x10'x8' each. Water is recirculated out of the third pond back to the trommel. These ponds are pit-type ponds without dams (p. 4).

Source of processing water = Snowmelt and seepage from the Rabbit portal and the Pete Mann Ditch.

Field observations

The operation is in the headwaters of Olive Creek. The area have been extensively hydraulically mined in the past. Most of the operation is more than 300 feet from any creek except Adit 3. Adit 3 discharges water that enters into Olive Creek.

Pond-specific information

On October 15, 2004, the district hydrologist found an area with two ponds that are separated by berms. Her field notes state that a channel cuts through both berms. There was question at the time if these were indeed the ponds referred to in the plan. On August 12, 2010, the fisheries biologist saw them and determined that the existing L & H ponds are outside the RHCAs of any streams.

Road-specific information

Miner proposes to use two existing temporary access (TA) roads (Appendix 6). The TA roads are native surface roads. Road 1305-E5a is at least 90 feet from the drainage in an area that has been hydraulically mined. There is no channel in this area. Road 1305-E5b is a short spur that accesses Adit 3 and is separated from Olive Creek by about 70 feet of forested ground. Road lengths are: 1305-E5a = 0.29 miles; 1305-E5b = 0.06 miles.

Pond-specific Conclusions

1. N/A. Ponds are outside the RHCA
2. N/A. Ponds are outside the RHCA
3. N/A. No streams nearby.
4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. Use of these existing roads is required in order to access the some of the sites which are inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Use of the two existing TA roads would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology because the roads are not the stream and separated from Olive Creek by about 70 feet of forested ground. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because the roads are existing.

- d) No impacts to the riparian vegetation because the roads are existing and at least 70 feet from Olive Creek.
- 3. No potential for a discharge from use of these TA roads under either alternative because 1) 1305-E5a in an area that has been hydraulically mined that lacks channels, and 2) 1305-E5b is separated from Olive Creek by about 70 feet of forested ground. The ground cover in this area is sufficient to effectively trap any sediment that would leave the road prior to its reaching the creek.
- 4. Conclusions are the same regardless of alternative.

Lightning (Placer)

Site was visited by the district hydrologist on October 4, 2010 (Field book 5).

Structures related to the Lightning operation that were evaluated for compliance with MM-2 are 1) existing ponds, 2) proposed ponds, 3) one existing temporary access (TA) road (1305-E6a), and 4) an existing bridge TA road 1305-E6b is outside the RHCA and therefore not evaluated for compliance with MM-2.

Plan information

Water for processing will be pumped from Lightning Creek under a 1921 water right. Just north of the bridge, three settling ponds exist, one with a headgate. The first is approximately 60' x 40' (horseshoe shaped) and collects seepage water from the open pit, which is site 1. The second pond is approximately 20'x20'. These will be deepened 10 – 15" (p. 3).

There are several sets of settling/recycling ponds existing on the claims, and these will be cleaned out as needed to keep the capacity sufficient for providing process water for site #1, to site #2 and then to site #3. Settling/recycling ponds will be improved as needed, but at site #1 right now there are three ponds, 10'x10', 40'x60' and 20'x20'. At site 3 all these ponds will be used, plus the pond north of the pit which is approximately 30'x40' in size.

At site #3, a small proposed pond approximately 10' x 10' will be excavated on the bench to catch the silt and sand, and then the water will move down into the tail race and into the two ponds that area west of the main access road. If necessary, the ponds east of the road will also be available to contain excess water in case of a storm event (p. 11).

Source of processing water = Lightning Creek

Field observations

Lightning Creek is perennial and fish-bearing. RHCA = 300 feet/side. Valley width in area proposed for processing is less than 300 feet and bounded by Lightning Creek and a hillslope. Area has been heavily mined historically.

Pond-specific information

The existing source water pond and settling ponds are located inside the RHCA of Lightning Creek and at least 60 feet from the creek. They are old dredge ponds and located on the east side of the creek and north of the bridge. Ponds are bounded by the creek and the hillslope and are separated from the creek by temporary access road 1305-E6a. The topography is flat in their vicinity. Other ponds exist east of the creek and south of the bridge but are not proposed for use.

Another settling pond is proposed for construction at mining site 3. The area where it is proposed is about 250 to 300 feet from the creek and thus inside the RHCA. The topography in this area is flat ground.

Road-specific information

Miner proposes to use two existing temporary access (TA) roads (Appendix 6). Road 1305-E6a is a native surface road. The road is at least 50 feet from the creek and is inside the RHCA. It is on flat ground, parallels the creek, and separated from the creek by a low berm of old placer tailings. Road length is: 0.07 miles

Road 1305-E6b is a native surface road and is used to access two of the mining area. It is almost 400 feet from the creek and outside the RHCA. This road is separated from the creek by road 1305-E6a, old dredge ponds, the berm and areas of flat ground. Road length = 0.1 miles

Bridge-specific information

Miner proposes to use an existing wooden bridge that crosses Lightning Creek and thus inside an RHCA. The bridge is adjacent to an existing ford. The bridge would be used to transport regular vehicles. The ford would be used to transport the heavy equipment to the mining sites because the bridge was not designed for heavy equipment.

Pond-specific Conclusions

Existing Source Water Ponds and Settling Ponds

1. The existing source water pond and settling ponds should not be moved outside the RHCA for the following reasons. If ponds were moved outside the RHCA the ponds would be on the hillslope because the valley bottom width in the area of the ponds is less than 100 feet. Hillslope ponds would be new construction and therefore new disturbance. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing ponds are old dredge ponds dug into flat ground, which is a highly stable location, and receive groundwater.
2. Use of the existing source water pond and settling ponds would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because

- a) No impacts to water quality for the reasons listed in #3 below.
- b) No impact to inchannel complexity because the ponds are not in the channel.
- c) No impact to channel morphology because the ponds are existing and separated from Lightning Creek by at least 60 feet, TA road 1305-E6a, and a low berm of old tailings. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
- d) No new soil disturbance because ponds are existing.
- e) No impacts to the riparian vegetation along the creek because the ponds are separated from Lightning Creek by at least 60 feet, TA road 1305-E6a and a low berm of old tailings. In addition, there would be no impact to the riparian vegetation that has developed in the old dredge ponds because only processing water will be discharged into the ponds.

3. *Source water pond*

No potential for a discharge related to use of the source water pond under either alternative into Lightning Creek because would only be withdrawing water.

Settling ponds

Surface flow: No potential for a discharge via surface flow from use of the settling ponds under either alternative into Lightning Creek because the ponds are old dredge ponds and separated from the creek by at least 60 feet, a road, and a low berm of old placer tailings.

Subsurface flow: No potential for a discharge subsurface flow from use of the the settling ponds under either alternative because 1) the pond bottoms are vegetated with lush rushes, sedges and brush which are effective at trapping fine sediment and 2) the ponds are at about the same elevation level as the stream.

4. Conclusions are the same regardless of alternative.

Proposed Settling Pond

- 1. The proposed settling pond should not be moved out of the RHCA for the same reasons noted above for the existing ponds.
- 2. Use of the proposed settling pond would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because

- a) No impact to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity because the pond would not be in the channel.
 - c) No impact to channel morphology because the pond would be at least 250 feet from Lightning Creek. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) No new detrimental soil conditions, despite being new construction, because the proposed pond would be located in a previously mined area.
 - e) No impacts to riparian vegetation from construction of the proposed pond because it would be at least 250 feet from Lightning Creek and would be constructed in an area with no riparian vegetation.
3. No potential for a discharge via surface or subsurface flow because the settling pond would be 250 to 300 feet from the creek in flat ground. In addition to the flat ground, there is a road and tailings separating the area from the creek. All of these features are effective sediment traps and would prevent any sediment generated by use of the pond from reaching the creek.
4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. Use of TA road 1305-E6a is required in order to access the sites which are inside the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.
2. Use of TA road 1305-E6a would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
- a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the road is not in the stream and separated from Lightning Creek by at least 50 feet of flat ground and a low berm of old tailings. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because it is an existing road.
 - d) No impact to the riparian vegetation for the same reasons noted for 2b.
3. No potential for a discharge from use under either alternative because it is separated from the creek by a low berm of old placer tailings, on flat ground and at least 50 feet from the

creek. The berm and the flat ground provide effective sediment traps. Therefore, any sediment generated as a result of use of this road that might erode off the road would be effectively trapped prior to reaching the creek.

4. Conclusions are the same regardless of alternative.

Bridge-specific Conclusions

1. The existing bridge is a structure that is designed to cross a creek and decrease impacts to the stream banks and channel bed. Therefore, it cannot be moved outside the RHCA because to do so would place it in an area where a bridge is not necessary. While use of the bridge is not required to access the mining sites and the processing site, use of the bridge by the miner would decrease how often the existing ford would be used and thus decrease potential impacts on fisheries (*See Chapter 3, Fisheries Section*).
2. Use of the bridge inside the RHCA would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the bridge is not in the stream.
 - c) No impacts to channel morphology because the bridge is existing, stable and spans the creek. Therefore, there would be no new impacts to stream banks and no change to width/depth ratios.
 - d) No new soil disturbance because the bridge is existing.
 - e) No impact to the riparian vegetation because the bridge is existing.
3. No potential for a discharge from use of the bridge because it is existing and stable and no modifications are planned.
4. Conclusions are the same regardless of alternative.

Little Cross 1 (Placer)

Site visited by district hydrologist on October 4, 2010 (Field book 5) and September 18, 2012 (Field book 7).

Structures related to the Little Cross operation that were evaluated for compliance with MM-2 are 1) one proposed ponds and 2) one existing temporary access road.

Plan information

Groundwater in the hole will be used to process tailings (p.4).

Source of processing water = Groundwater

Field observations

Granite Creek is perennial and fish-bearing. RHCA = 300 feet/side. Valley bottom width on north side of Granite Creek between the creek and County Road 24 is less than 300 feet.

Pond-specific information

The test hole, which is also going to be both the source water pond and the settling pond, is on the road that leads to the Granite Creek ford. The pond would be inside the RHCA of Granite Creek. The test hole will be on the ford approach which is unvegetated and old dredge tailings. There are some fines in the tailings. The distance between the proposed test hole/pond and the creek is than 25 feet.

Road-specific information

Miner proposes to use one existing temporary access road (Appendix 6). Road is inside the RHCA of Granite Creek. Road 1000-E3a is composed of old placer tailings. The road is along flat ground, is within 50 feet of the creek at its closest point, and separated from the creek by a berm composed of old placer tailings. Road length is 0.03 miles.

Pond Conclusion

1. The proposed source water/settling pond cannot be moved outside the RHCA because the pond is also the test hole which is located insider the RHCA.
2. Under Alternative 2, construction and use of the pond/test hole would NOT be in compliance with MM-2 as it pertains to streams because
 - a) Potential for a discharge and therefore a local impact on water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity under either alternative because the pond is not in the channel.
 - c) No impact to channel morphology under either alternative because the pond would be located on the ford approach to Granite Creek and therefore there would be no impact to stream banks and no change in channel width/depth ratios.

However, construction and use of the pond/test hole would be in compliance with MM-2 as it pertains to activity inside the RHCA because

- d) No new detrimental soil disturbance under either alternative, despite being new construction, because it would be located in an area that has been previously mined and has little ground vegetation. However, even though there would not be new detrimental soil disturbance, Forest Service General Requirement R-15 (appendix 2) would be added under Alternative 3. R-15 requires that the pond be reclaimed once mining activity was done.
- e) No impact to the riparian vegetation because there is no riparian vegetation in this area.

Under Alternative 3, construction and use of the source water/settling pond **would be in compliance** with MM-2 as a result of the addition of the FS WRPM discussed in #3 below.

3. Alternative 2

Surface flow: Potential for a discharge via surface flow of sediment into the creek when both source water and settling pond because the test hole/pond would be dug into the road that leads to the ford that crosses Granite Creek. The road slopes towards the creek, has no ground cover and area of the road to be mined is within 15-20 feet of the stream bank.

Subsurface flow: Potential for a discharge via subsurface flow because the hole is into old tailings and the permeability of the sediments is likely high. As a result, there would be the possibility that water in the hole could create a seepage zone in the road, and in the process remobilize fine sediment on the surface of the road. In both cases, sediment entering the creek would result in a local reduction of water clarity.

Alternative 3

Discharge potential via surface or subsurface flow **would be eliminated** as a result of the addition of a Forest Service site-specific WRPM. The WRPM would eliminate the potential for sediment to reach the creek by placing straw bales between the activity and creek to trap any sediment that moves down the ford approach.

- 4. Conclusions vary as a function of alternative. A site-specific Forest Service WRPM would be added to Alternative 3. This WRPM would bring the construction and use of the pond into compliance with MM-2 by eliminating the potential for a discharge as a result of Pond-specific information activity. In addition, as stated under 2d, Forest Service General Requirement R-15 would still require that the pond be reclaimed once mining activity was done.

Road-specific Conclusions

- 1. Use of the existing TA road is required in order to access the site which is inside the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.

2. Use of the road would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the road is not in the stream and separated from Granite Creek by an berm of old placer tailings and at least 50 feet except at the ford approach. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because it is an existing road.
 - d) No impact to the riparian vegetation because no riparian vegetation in the road area.
3. No potential for a discharge from use of this road under either alternative because it is along flat ground and is separated from the creek by a berm composed of old placer tailings. The berm and the flat ground provide effective sediment traps. Any sediment generated as a result of road use and might erode off the road would be trapped prior to reaching the creek.
4. Conclusions are the same regardless of alternative.

Lucky Strike (Placer/Lode)

Site visited by district hydrologist on October 19, 2004 (Field book 2).

There are no structures inside the RHCA as the site is located on a ridge. Therefore, the question of compliance with MM-2 does not apply.

Plan information

Local water source (existing spring) (p. 5).

Source of processing water = spring

Field observations

In the Quartz Gulch drainage. More than 300 feet from any stream. RHCA = N/A. Material would be processed at the mill.

Pond-specific information

There are no ponds.

Road-specific information

Miner would only use open Forest Service roads that are also used by the general public or private roads.

Ponds Conclusions

1. N/A. There are no ponds.
2. N/A. There are no ponds.
3. N/A. There are no ponds.
4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. N/A. Only open Forest Service roads used to access the site. The road in the vicinity of the site is outside the RHCA. .
2. N/A. MM-2 does not apply because the roads in the vicinity of the site are outside the RHCA.
3. No potential for a discharge from use of roads under either alternative because they are more than 300 feet from any stream.
4. Conclusions are the same regardless of alternative.

Make It (Placer)

Site visited by district hydrologist on November 5, 2004 (Field book 4). Name at that time was Rock-O-Gold. Name changed but the Plan has remained the same.

Structures related to the Make-It operation that were evaluated for compliance with MM-2 are 1) an existing source water pond, 2) existing depressions to be used as settling ponds, and 3) one existing temporary access road.

Plan information

Water to be obtained from existing ponds (using buckets) and disposal of dirty water into depressions in old dredging's.... Water will be returned to an existing off channel pond (p. 3).

Water for the processing will be from the existing pond...The discharge water will go into existing depressions (settling pond) in old dredging's (p.4).

NOTE: the “off channel ponds” referenced in the miner’s Plan are actually the old depressions located back against the hillslope.

Source of processing water = existing pond which has a surface connection to Granite Creek.

Field observations

Granite Creek is perennial and fish-bearing. RHCA = 300 ft/side. Valley bottom width in area proposed for activity less than 300 feet and is bounded by Granite Creek and a hillslope.

Pond-specific information

The source water pond is an existing pond that has a surface connection to Granite Creek via a side channel. Water will only be withdrawn from this pond. No sediment will be added. The pond is inside the RHCA.

The existing settling ponds are old depressions related to past mining activity. Settling ponds are located between the creek and a gated miner’s access road to old cabins to the east and about 80 feet from the creek. Ground is largely flat with limited vegetation. The area is old placer tailings that have been flattened. Soil productivity is very low.

Road-specific information

Miner proposes to use one existing temporary access (TA) road (Appendix 6). The road is inside the RHCA of Granite Creek. TA road 7300-E2a is native surface and runs along the base of the hillslope. It is separated from creek by 80 feet of flat ground and a forested strip that has developed on the road’s fill slope. Road length is 0.37 miles.

Pond-specific Conclusions

1. The existing source water pond and the existing settling ponds (depressions) should not be moved outside the RHCA for the following reasons. If ponds were moved outside the RHCA the ponds would be on the hillslope because the valley bottom width in the area of the ponds is less than 300 feet. Hillslope ponds would be new construction and therefore new disturbance. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing ponds are dug into flat ground, which is a highly stable location, and receive some groundwater.
2. Use of the existing source water pond and the settling ponds would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impact to water quality for the reasons listed in #3 below.

- b) No impact to inchannel complexity because the pond is not in the channel, though it is connected to it by a side channel.
- c) No impact to channel morphology because the pond is used as source water only. Therefore no changes would occur to the stream banks and thus channel width/depth ratios.
- d) No new soil disturbance because it is an existing pond.
- e) No impact to the riparian vegetation along Granite Creek for the reasons noted in #2c.

3. *Source water pond*

No potential for a discharge as a result of using of the source water pond because water would only be withdrawn from the pond. No sediment would be added.

Settling ponds

Surface flow: No potential for a discharge via surface flow from the settling ponds into Granite Creek under either alternative because the ponds are old depressions ponds and separated from the creek by about 80 feet across flat ground.

Subsurface flow: No potential for a discharge via subsurface flow from the ponds to the creek under either alternative because the ponds are at least 80 feet from the creek, at a similar elevation as the stream, and the flattening of the placer tailings across the valley bottom has likely decreased the permeability of the old tailings.

4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

- 1. Use of the existing TA road is required in order to access the sites which are inside the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.
- 2. Use of the existing TA road would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the road is not in the stream and separated from Granite Creek by more than 80 feet of flat ground. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.

- c) No new soil disturbance because it is an existing road.
 - d) No impact to the riparian vegetation because there is no riparian vegetation in this area.
3. No potential for a discharge from use of the road under either alternative because it is separated from creek by 80 feet of flat ground and a forested strip that has developed on the road's fill slope. The intervening ground and forested strip are effective sediment traps.
4. Conclusions are the same regardless of alternative.

Muffin (Placer)

Site visited by district hydrologist on September 18, 2012 (Field book 7) and on September 21 and 24, 2012 (Field book 8).

Structures related to the Muffin operation that were evaluated for compliance with MM-2 are 1) one existing source water pond, 2) two existing settling ponds, 2) one Forest Service closed road and 3) one existing temporary access road.

Plan information

There is one processing site. Processed water comes from reservoir approximately 45'x25'x3'. Off channel settling recycling ponds are approximately 10'x80'x6 and 8'x20'x4' (p. 6).

Source of processing water = Ground water. There is no surface connection between the pond and Last Chance Creek.

Field observations

Last Chance Creek has become disconnected from Boulder Creek as the result of past mining activity which built multiple berms across the valley bottom creating a series of ponds. Thus there is no surface connection between Boulder Creek and Last Chance Creek. Last Chance has perennial flow in places but is not fish-bearing. RHCA = 150 ft/side. Total valley bottom width is less than 150 feet and bounded on both sides by hillslopes.

Pond-specific information

Three existing ponds are proposed for use. They are located inside the RHCA of Last Chance Creek. The pond designated a source water pond is located on the edge of the valley floor meadow. The pond is well bermed and water is at least 2 feet below the top of the berm. To the west of the pond, the valley floor is well vegetated.

There are two settling ponds. One is designated as the primary pond and one as the overflow pond. The primary settling pond is up out of the gulch on flat ground and separated from the gulch by the source water pond and the overflow settling pond.

The overflow settling pond is separated by a berm from the source water pond and is downstream of the source water pond. There are small channels in the valley bottom of the gulch west of the ponds and at least one of the channels carries water in each of segments between the valley dams. Water table is high and the valley bottom contains dense lush grasses. Ground is flat and spongy. Valley bottom width varies at the different mining sites. Site 1 = 36 feet paced, Site 2 = 40 feet paced, and Site 3 = 68 feet paced. Site 4 is more than 300 feet from Last Chance Creek.

Road-specific information

Miner proposes to use one Forest Service closed road and one existing temporary access (TA) road (Appendix 6). Both roads are native surface roads and portions are within the RHCA of Last Chance Creek. Forest Service closed road 7355-012 ends in the camp site and does not reach the creek. The existing temporary access road (7355-M1a) crosses the creek on an old berm to access mining areas 1 and 3 and the processing site and then parallels the valley. TA 7355-M1a is more than 100 feet from the creek after it crosses the creek at the designated crossing point and the intervening ground is well forested and has 80 to 100% ground cover. In addition, the creek itself is 20 feet from the hillslope edge and located within a meadow composed of very lush grasses and forbs. Road lengths are: FS 7355-012 = 0.18 miles; TA road 7355-M1a = 0.08 miles

Pond-specific Conclusions

1. The existing source water pond and the settling ponds should not be moved outside the RHCA for the following reasons. If ponds were moved outside the RHCA the ponds would be on the hillslope because the valley bottom width in the area of the ponds is less than 100 feet. Hillslope ponds would be new construction and therefore new disturbance. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing ponds are dug into flat ground, which is a highly stable location, and receive groundwater.
2. Use of the existing source water pond and the two settling ponds would be in compliance with MM-2 under both alternatives as it pertains to stream and activity inside the RHCA because
 - a) No impact to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity because the ponds are not in the channel.

- c) No impact to channel morphology because the ponds are existing and separated from the little creek that flows through the meadow in this area by at least 25 feet. Therefore there would be no effect on stream banks and no change in channel width/depth ratios.
- d) No new soil disturbance because they are existing ponds.
- e) No impact to the riparian vegetation in Last Chance Creek meadow area. The ponds are separated from the meadow by a low berm. In addition, there would be no impact to the riparian vegetation that has developed around the old dredge ponds because only processing water will be discharged into the ponds. There is no activity proposed in the riparian area around the dredge ponds that would alter vegetation.

3. *Source Water Pond*

No potential for a discharge via surface or subsurface flow under either alternative into Last Chance Creek because only withdrawing water.

Settling Ponds

No potential for a discharge via surface or subsurface flow under either alternative into Last Chance Creek from use of the existing ponds because the ponds are well sealed, dug into the ground and surrounded by a low berm.

- 4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

- 1. Use of these existing roads is required in order to access Sites 1, 2, and 3 which are located inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
- 2. Use of the closed Forest Service road and the existing TA road would be in compliance with MM-2 under both alternatives because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the roads are not in the stream and the TA road crosses the Last Chance Creek meadow area on an old berm. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because they are existing roads.

- d) No impact to the riparian vegetation because riparian vegetation is not in the roaded area.
- 3. TA 7355-M1a: No potential for a discharge from use of this road because the forested ground, the meadow vegetation and the distance from the creek would effectively trap any sediment that leaves the road and prevent it from reaching the creek.

FS closed road 7355-012: No potential for a discharge from using this road because it ends in the camp site and does not reach the creek.
- 4. Conclusions are the same regardless of alternative.

Old Eric 1 & 2 (Placer)

Site visited by district hydrologist on August 25, 2010 (Field book 5). Additional discussion occurred with Chris Helberg, the minerals administrator, in 2012 related to clarify areas to be used.

Structures related to the Old Eric 1 & 2 operation that were evaluated for compliance with MM-2 are 1) one existing source water pond, 2) one existing settling pond, 3) one existing temporary access road, and 4) one existing bridge.

Plan information

Water for processing will come from ground water which fills an old settling pond and is recirculated. Water from processing is discharged into a settling pond...The old ditch which intersects with the creek will be closed off so that water cannot drain from the settling pond (p. 6).

Source of processing water = Ground water. There is no surface connection between the pond and Granite Creek. Pond back against the hillside.

Field observations

Granite Creek is perennial and fish-bearing. RHCA = 300 ft/side. Valley bottom width is less than 300 feet on the west side of Granite Creek.

Pond-specific information

Two existing ponds are proposed for use. They are located inside the RHCA of Granite Creek. The source water pond is an old mining test hole and located against the hillslope. It is about 175 feet from the creek and about 60 feet from an old ditch that connects to the creek. The ground between the source water pond and the creek has 100% ground cover of lush grasses and forbs.

The existing settling pond parallels the creek, is elevationally above the creek, and 15 feet from Granite Creek. It is 80 feet long and 54 feet wide according to the map provided in the Plan. The bottom of the pond is lush with grasses, sedges, forbs, and rushes and some cropped willows. The Plan provides an alternate settling pond which has a ditch that connects it to the stream. This alternate pond is smaller and more distant from the creek.

Road-specific information

Miner proposes to use one existing temporary access (TA) road to access his campsite (Appendix 6). The road is inside the RHCA of Granite Creek and composed of old tailings (limited sediment source) and ends at the campsite. It does not cross the creek. Road length is 0.4 miles.

Bridge-specific information

There is an existing wooden bridge that crosses Granite Creek. The bridge is inside the RHCA.

Pond-specific Conclusions

Source water pond

1. The pond should not be moved outside the RHCA for the same reasons noted for the settling pond.
2. Use of the processing pond would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impact to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity because the pond is not in the channel.
 - c) No impact to channel morphology because the pond is existing and separated from Granite Creek by about 175 feet of flat, well-vegetated ground. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) No new soil disturbance because it is an existing pond.
 - e) No impact to the riparian vegetation because the pond is separated from Granite Creek by 175 feet.
3. No potential for a discharge because the pond would only be used as source water. No sediment would be added.
4. Conclusions are the same regardless of alternative.

Settling Pond

1. The existing source water pond and the settling pond should not be moved outside the RHCA for the following reasons. If the pond were moved outside the RHCA it would be on the hillslope because the valley bottom width in the area of the pond is less than 100 feet. Hillslope pond would be new construction and therefore new disturbance. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, The settling pond is into flat ground, the walls and bottom of the pond are well vegetated with grasses and sedges and it is in a highly stable location.
2. Under Alternative 2, the use of the settling pond would NOT be in compliance with MM-2 as it pertains to streams because
 - a) Potential impact to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity under either alternative because the ponds are not in the channel.
 - c) No impact to channel morphology under either alternative because the pond is existing and separated from Granite Creek by 15 feet and a low berm. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.

Pond use would be in compliance with MM-2 as it pertains to activity inside the RHCA because

- a) No new soil disturbance because it is an existing pond.
 - b) No impact to the riparian vegetation along Granite Creek because the pond is 15 feet from the creek, is existing and no changes are proposed for the pond.
3. **Alternative 2**

Surface flow: No potential for a discharge via surface flow because the pond is large is size and is bermed.

Subsurface flow: No potential for a discharge via subsurface flow of **sediment** because the pond bottom and sides are well vegetated with lush grasses and rushes which are effective at trapping sediment.

However, there is a potential for a discharge via subsurface flow of **elevated water temperatures** because pond is large and unshaded. Therefore, if the amount of water in the pond was such that it remained in the pond for multiple days there is the potential for it to heat up. As the pond is elevationally above the creek, parallels the creek for 80 feet, and

within 15 feet of the creek the result could be the influx of warmer water entering Granite Creek. This would result in a localized increase in stream temperatures and loss of local refugia as a result warm pond water entering the creek via subsurface flow.

Alternative 3

Surface flow: Same as Alternative 2. No potential for a discharge via surface flow because the pond is large in size and is bermed.

Subsurface flow: Potential for discharge via subsurface flow of warm water **would be eliminated** with the addition of a Forest Service site-specific WRPM (Appendix 1A). This WRPM limits the length of time that there can be standing water in the settling pond to 1 day or less.

4. The conclusions vary as a function of alternative because a Forest Service site-specific WRPM is added to Alternative 3. This site-specific WRPM brings the use of the settling pond into compliance under Alternative 3 with respect to MM-2 because it would eliminate the potential for a discharge of warm water into Granite Creek. Therefore, there would be no change in existing water quality.

Road-specific Conclusions

1. Use of the existing TA road is required in order to access the site which is inside the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.
2. Use of the existing TA road would be in compliance with MM-2 under both alternatives as it pertains to stream and activity inside an RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity or channel morphology from road use because the road is not in the stream and used to only access the campsite. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because it is an existing road.
 - d) No impact to the riparian vegetation because there is no riparian vegetation in the roaded area.
3. No potential for a discharge from use of the road under either alternative because the road is composed of old tailings (limited sediment source), does not cross the creek, the ground is flat and the road ends about 20 feet from the creek. Topography and the distance are effective at trapping any sediment that leaves the road prior to it reaching the creek.

4. Conclusions are the same regardless of alternative.

Bridge-specific Conclusions

Existing bridge

1. The existing bridge is a structure that is designed to cross a creek and decrease impacts to the stream banks and channel bed and is required for access to the mining and processing sites. Therefore, it cannot be moved outside the RHCA because to do so would place it in an area where a bridge is not necessary.
2. Use of the bridge inside the RHCA would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the bridge is not in the stream.
 - c) No impacts to channel morphology because the bridge is existing, stable and spans the creek. Therefore, there would be no new impacts to stream banks and no change to width/depth ratios.
 - d) No new soil disturbance because the bridge is existing.
 - e) No impact to the riparian vegetation because the bridge is existing.
3. No potential for a discharge from use of the bridge because it is existing and stable and no modifications are planned.
4. Conclusions are the same regardless of alternative.

Olive Tone (Placer)

Site visited by district hydrologist on October 3, 2012 (Field book 10).

Structures related to the Olive Tone operation that were evaluated for compliance with MM-2 are 1) two proposed settling ponds and 2) two existing temporary access roads.

Plan information

Two off channel ponds located approximate 40 feet from the creek will be approximately 20' by 10' each in size. Process water will come from the spring.....A second processing site may be established near the north end...(p.8).

Correspondence (10/2/11): Will be establishing 2 new ponds on the west side of Olive Creek. The first pond will be for sediment and the second pond will be used to store overflow from the first pond....The second pond will be used for replenishing process water and evaporation purposes. Both ponds will be bermed on the stream side to prevent runoff...

Source of processing water = spring and Olive Creek.

Field Observations

Olive Creek is perennial and fish-bearing. RHCA = 300 ft/side. Valley width on the west side of Olive Creek is less than 100 feet and bounded by the creek and a hillslope. Valley bottom width measured from the valley floor terrace-channel break in slope to the old tailings up against the west hillslope is about 60 feet paced

Pond-specific information

Proposed ponds would be located in the RHCA and would be settling ponds only. Ponds would be elevationally above Olive Creek as the terrace is about 4.5 to 5 feet above the creek and at least 50 feet from the creek. The ponds would be in old, flattened placer tailings. Permeability of the tailings may be high enough to allow subsurface flow from the ponds towards the creek especially since the ponds are elevationally above the creek.

The water for processing would come from either Olive Creek or a spring and there is no source water pond identified for construction and use.

Road-specific information

Miner proposes to use two existing temporary access (TA) roads (Appendix 6). The roads are within the RHCA of Olive Creek. Road 1305-E4a is an existing native surface road used to access the site. It is on the east side of Olive Creek and about 30 feet from it. The road parallels the creek and is elevationally above the creek. The ground between the creek and the road is forested. Road length is 0.2 miles.

Road 1305-E4b is an existing native surface and tailings road. It is located on the west side of Olive Creek. It is about 20 feet from the creek, on flat ground and parallels the hillslope. Ground cover is very limited as soil productivity is low being old tailings. It consists mainly of scattered colonizers.

Pond-specific Conclusions

1. The settling ponds should not be moved outside the RHCA for the following reasons. If ponds were moved outside the RHCA, the ponds would be on the hillslope because the valley bottom width in the area of the ponds is less than 100 feet. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the area where the ponds are proposed for construction would be dug into flat ground, which is a highly stable location, and would receive some groundwater.

No source water pond proposed for construction and use. Water would come directly from either Olive Creek or a spring.

Pond Construction

2. Pond construction of the settling ponds would be in compliance with MM-2 under both alternatives as it pertains to stream and activity inside the RHCA because
 - a) No impact to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity because the ponds are not in the channel.
 - c) No impact to channel morphology because the ponds would be at least 50 feet from Olive Creek. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) No new detrimental soil disturbance, despite being new construction, because it would occur in an area that has been previously mined and has little ground vegetation.
 - e) No impact to the riparian vegetation because the ponds are separated at least 50 feet from Olive Creek and there is no riparian vegetation where the ponds are to be located.
3. No potential for a discharge via surface flow during pond construction into Olive Creek under either alternative because the ponds would be dug into the ground and are separated from the creek by 50 feet of flat ground.
4. Conclusions are the same regardless of alternative.

Pond Use

2. Under Alternative 2, pond use of the settling ponds would NOT be in compliance with MM-2 as it pertains to streams because
 - a) Potential impact water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity under either alternative because the ponds are not in the channel.
 - c) No impact to channel morphology under either alternative because the ponds are existing and separated from Granite Creek by County Road 24. Therefore there would be no impact to stream banks and no change in channel width/depth ratios

However, pond use of the settling ponds would be in compliance with MM-2 as it pertains to activity inside the RHCA because

- d) No new detrimental soil disturbance, despite being new construction, because it would be located in an area that has been previously mined and has little ground vegetation.
- e) No impact to the riparian vegetation because there is no riparian vegetation in this area.

3. **Alternative 2**

Surface flow: No potential for a discharge via surface flow because the settling ponds would be dug into the ground and would be at least 60 feet from the creek on flat ground.

Subsurface flow: Potential for a discharge via subsurface flow from the settling ponds into the creek because the settling ponds 1) would be in old placer tailings, 2) would be elevationally above the creek resulting in groundwater flow would be towards the creek, and 3) the old tailings have a high permeability and large pores allowing both sediment and water to move through the subsurface. In addition to the sediment from the pond potentially reaching the creek, the water moving towards Olive Creek via subsurface flow could mobilize the bank sediments when the water reemerged at the stream bank face. These seepage zones have the potential to also add sediment into the creek.

Alternative 3

Surface flow: Same as Alternative 2. No potential for a discharge via surface flow.

Subsurface flow: Different than Alternative 2. Under Alternative 3, discharge potential via subsurface flow **would be eliminated** as a result of the addition of a Forest Service site-specific WRPM that decreases the permeability of the settling pond sediments (Appendix 1 A and 1C). This WRPM would create a buried barrier between the pond and the stream that would prevent any sediment that left the pond from moving via groundwater to the stream bank.

- 4. Conclusions vary as a function of alternative. A Forest Service site-specific WRPM would be added to Alternative 3. This WRPM brings the use of the settling ponds into compliance under Alternative 3 with respect to MM-2 by eliminating the potential for a discharge as a result of pond use.

Road-specific Conclusions

1. Use of these existing TA roads is required in order to access the site because the site is inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Use of the existing TA roads would be in compliance with MM-2 under both alternatives because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity or channel morphology from road use because the roads are not in the stream except at the designated ford. TA road 1305-E4a is separated from Olive Creek by 30 feet. TA road 1305-E4b is separated from Olive Creek by 20 feet. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because they are existing roads.
 - d) No impact to the riparian vegetation because the roads are existing and there is no riparian vegetation in the roaded area except in the area of the designated ford.

3. *TA Road 1305-E4a (existing)*

No potential for a discharge from use of this existing TA road under either alternative because the forested ground cover is an effective sediment trap and would trap any sediment that left the road before it reaching the creek.

TA Road 1305-E4b (existing)

No potential for a discharge from use of this existing TA road under either alternative even though the ground cover is limited because the flat topography and distance from the creek are effective sediment traps and would trap any sediment that left the road before it reached the creek. In addition, the road surface is old tailings and therefore sediment production from road use is expected to be minimal.

4. Conclusions are the same regardless of alternative.

Rosebud (Placer)

Site visited by district hydrologist on September 8, 2011 (Field book 6).

Structures related to the Rosebud operation that were evaluated for compliance with MM-2 are 1) two ponds (a source water pond and a settling pond) and 2) one existing TA road.

Plan information

Water used in processing will come from existing depressions filled with water. Waste water from processing will be captured in nature depressions and allowed to soak into the ground (p.2-3).

Only water used will be pumped from existing holes to the small trommel....Water from processing will be directed to settling ponds (p.3).

Source of processing water = Ground water. There is no surface connection between the old dredge ponds and Granite Creek.

Field observations

Granite Creek is perennial and fish-bearing. RHCA = 300 ft/side. Valley bottom width from creek to base of east hillslope is less than 150 feet.

Pond-specific information

The existing source water pond is 375 feet from Granite Creek and located outside the RHCA. Ponds are located on the east side of Granite Creek and separated from Granite Creek by County Road 24. The source water pond is located between County Road 24 and the powerline road and is an old dredge pond. It taps into groundwater.

The existing settling ponds are a series of dry depressions along the base of the hillslope related to past mining as well. The settling ponds are between the powerline road and the hillslope and composed of fine-grained sediments. Some of the settling ponds have well-defined boundaries and are sufficiently bermed, while others are not. They are 475 feet from Granite Creek and outside the RHCA as well.

Road-specific information

Miner proposes to use one temporary access road (TA road 1000-E2a). It is also referred to as the powerline road (Appendix 6). The road is a native surface road. Road length is 0.46 miles and is outside the RHCA.

The road is more than 300 feet from Granite Creek and is separated from the creek by County Road 24 and old dredge ponds and outside the RHCA. Abundant riparian vegetation has become established around the old dredge ponds sediment.

Pond-specific Conclusions

Source water pond

1. N/A. Ponds are outside the RHCA
2. N/A. Ponds are outside the RHCA and therefore the question of compliance with MM-2 does not apply.
3. N/A. Nearest stream is 375 feet away and separated from activity by a County road 24..
4. Conclusions are the same regardless of alternative.

Settling ponds

1. N/A. Ponds are outside the RHCA
2. N/A. Ponds are outside the RHCA and therefore the question of compliance with MM-2 does not apply.
3. N/A. Nearest stream is 375 feet away and separated from activity by a County road 24..
4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. N/A. Road is outside the RHCA.
2. N/A. Road is outside the RHCA and therefore the question of compliance with MM-2 does not apply.
3. No potential for a discharge from use of the road under either alternative because the road is more than 300 feet from Granite Creek, is separated from the creek by County Road 24 and old dredge ponds that have extensive riparian vegetation around them. County Road 24, the dredge ponds and the riparian vegetation are all effective sediment traps which would prevent any sediment generated as a result of road use from reaching Granite Creek or the dredge ponds.
4. Conclusions are the same regardless of alternative.

Royal White (Lode)

Site visited by district hydrologist on October 19, 2004 (Field book 2).

There are no structures located inside any RHCA because the ponds, roads and site are located on a ridge.

Plan information

Water from runoff fills the lower Royal White portal #2 in the spring and this water is pumped up to the Royal White #1 and is used for milling while it is available. Process water is caught in tanks and recycled. When water becomes too muddy to use in the milling process, it is drained into the existing pond at the Royal White site #1 and allowed to seep and/or evaporate. When this source of water dries up, water is hauled in from the storage reservoir located at the Blackhawk portal.....The pond, approximately 20'x30'x6' has been in place for many years and is well sealed (p.7).

When the process water is too muddy to reuse, it is deposited in a pond approximately 20'x30'x6' and allowed to evaporate (p. 9).

Source of processing water = Runoff and storage reservoir. There are no streams nearby.

Field observations

Site located in the Irish Gulch drainage of Olive Creek and on a ridge. Site is more than 300 feet from any stream. RHCA = N/A.

Pond-specific information

Royal White ponds are outside the RHCA. They are more than 300 feet from any drainage being located on a ridge.

Road-specific information

Miner proposes to use three existing temporary access roads (Appendix 6). All are native surface roads. The roads are on a ridge and there are no streams or stream channels or wetlands in the area. They are outside the RHCA.

Pond-specific Conclusions

1. N/A. Ponds are outside the RHCA
2. N/A. Ponds are outside the RHCA and therefore the question of compliance with MM-2 does not apply.
3. N/A. No streams nearby.
4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. N/A. Roads are outside the RHCA.
2. N/A. Roads are outside the RHCA and therefore the question of compliance with MM-2 does not apply.

3. No potential for a discharge from use of any of the roads because the roads are on a ridge and there are no streams or stream channels or wetlands in the area.
4. Conclusions are the same regardless of alternative.

Ruby (Placer)

Sites visited by district hydrologist on October 4, 2010 (Field book 5), September 24, 2012 (Field book 8), and September 28, 2012 (Field book 9).

Structures related to the Ruby operation that were evaluated for compliance with MM-2 are 1) six existing temporary access (TA) roads and 2) a temporary ATV bridge. There are no ponds as the miner would be using a self-contained processing unit.

Plan information

Water for processing will be from the self-contained wash plant and the test hole. The only land application is the immediate area of the washing procedure....Will stay a minimum of 10 feet from the edge of the water and the riparian vegetation will remain intact in that area. (p. 5).

Source of processing water = unknown. The Plan says that they will be using a self-contained wash plant but does not identify where the water for the wash plant will be coming from. The Forest Service is assuming that the miner is trucking in the water because he hasn't requested an on-site source.

Field observations

Sites are located on Ruby Creek which has intermittent flow and is seasonally fish-bearing. RHCA = 300ft/side and Lightning Creek with is perennial and fish-bearing. RHCA = 300 ft/side.

Pond-specific information

There are no ponds. A self-contained unit serves as "source water pond and settling ponds."

Road-specific information

Miner proposes to use six existing temporary access (TA) roads to access the various sites and one temporary ATV bridge (Appendix 6). The roads are all native surface and all of the roads are within the RHCA of Clear Creek.

Road 1310-E1a is used to access Sites 1, 2 and 3. This road is native surface and composed of fine sediment. During high flows, there are places where Ruby Creek overtops its stream banks and water flows onto and down the road to the Ruby Creek ford area. Road length is 0.62 miles need to work up because of soil generated by use.

Road 1310-E1b is used to access Site 2. This road is native surface and composed of fine sediment. Road is outside the influence of Ruby Creek. Road length is 0.03 miles.

Road 1310-E3a is used to access sites 4 and 5. This road is separated from Clear Creek by 85 to 100 feet of vegetated ground. The topography is flat. Road length is 0.07 miles.

Road 1310-E3b is used to access site 6. The road at site 6 is 150 feet from Clear Creek. The topography is flat and there is 80 to 100% ground cover of grasses and forbs between the road and the creek. Road length is 0.06 miles

Road 1310-E3c is used to access site 7. It is more than 100 feet from the creek and behind a low ridge. Road length is 0.02 miles.

Road 1310-E4a is used to access Site 8. The road is more than 200 feet from the creek. The ground cover between the creek and the road is lush grasses and forbs. The road is on flat ground. Road length is 0.09 miles.

Bridge-specific information

The proposed ATV bridge would be used to cross Clear Creek and access Sites 1, 2, and 3 with ATV. Miner plans to still ford Clear Creek with equipment. Stream banks where the bridge would go are composed of fine grained sediment and the banks are unvegetated. While use of the proposed bridge is not required to access mining sites 1, 2, and 3, use of the bridge by the miner would decrease how often the existing Clear Creek ford would be used and thus decrease potential impacts on fisheries (See *Chapter 3, Fisheries Section*).

Pond-specific Conclusions

1. N/A. There are no ponds
2. N/A. There are no ponds so the question of compliance with MM-2 does not apply.
3. No discharge potential. Processing unit is self-contained.
4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

All Temporary Access Roads EXCEPT TA 1310-E1a

1. Use of these five existing TA roads is required in order to access the sites which are all located inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Use of these five TA access roads would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because

- a) No impacts to water quality for the reasons listed in #3 below.
- b) No impacts to inchannel complexity or channel morphology from road use because the roads are not in the creeks and separated from creek by 25 feet or more. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
- c) No new soil disturbance because they are existing roads.
- d) No impact to the riparian vegetation because the road are existing and not next to the creeks.

3. *1310-E1b to Site 2*

No potential for a discharge for under either alternative because the road is outside the influence of Ruby Creek, on flat ground, and the ground cover between the creek and road is lush grasses. Any sediment that would leave the road would be effectively trapped prior to reaching the creek.

1310-E3a to Sites 4 and 5

No potential for a discharge for under either alternative because the road is separated from Clear Creek by 85 to 100 feet of vegetated ground and the topography is flat. The combination of distance, flat, and well-vegetated ground would effectively trap any sediment that left the road prior to it reaching Clear Creek.

1310-E3b to Site 6

No potential for a discharge for under either alternative for the same reasons stated for 130-E3a above.

1310-E3c to Site 7

No potential for a discharge for under either alternative because it is completely disconnected from Clear Creek by the low ridge and sediment would be trapped behind the ridge.

1310-E4a to Site 8

No potential for a discharge for under either alternative for the same reasons for the same reasons stated for 130-E3a above.

4. Conclusions are the same regardless of alternative.

Temporary Access Road 1310-E1a

1. Use of this existing TA road is required in order to access sites 1, 2, and 3 which are all located inside the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.

2. Alternative 2

Use of 1310-E1a would NOT be in compliance with MM-2 as it pertains to streams because

- a) Impact to water quality for the reasons listed in #3 below.
- b) No impacts to inchannel complexity or channel morphology from road use because the road is existing. Therefore, there would be no impacts to stream banks and no change to width/depth ratios even though the creek flows down the road at high flows.

However, use of 1310-E1a would be in compliance with MM-2 as it pertains to activity inside the RHCA because

- c) No new soil disturbance because it is an existing road.
- d) No impact to the riparian vegetation for the same reasons noted for 2b.

Alternative 3

Under Alternative 3, the use of this road would come into compliance with MM-2 as it pertains to streams for the reasons stated in #3 below.

Use of 1310-E1a would still be in compliance with MM-2 as it pertains to activity inside the RHCA for the same reasons noted under Alternative 2.

3. Alternative 2

Potential for a discharge into Ruby Creek as a result of using this road because 1) it is a native surface road composed of fine sediment and 2) the road becomes part of the creek during the spring high flows. Use of the road by vehicles would break up any armoring that has developed on the road bed and generate fines (Burroughs and King, 1989; Luce and Black 1999; Luce and Black 2001; Swift 1984). The sediment would then be transported down the road and into Ruby Creek at the ford when the creek waters flows overtopped it banks.

Alternative 3

Discharge potential **would be eliminated** because the Forest Service site-specific WRPMs would 1) prevent the stream from flowing onto the road and transporting sediment generated by use into the creek at the ford, 2) require that sections of the road be rocked, and 3) require that the ford approaches be rocked. These protection measures would eliminate the sources of sediment that could enter into Ruby Creek as a result of road use related to mining activity.

4. Conclusions vary as a function of alternative. Forest Service site-specific WRPMs for the Road 1301-E1a are added to Alternative 3. These WRPMs bring the use of the road into compliance with MM-2 by eliminating the potential for a discharge.

Bridge-specific Conclusions

1. The proposed ATV bridge is NOT required to access these sites because an existing ford exists adjacent to the proposed bridge site that could be used to cross Clear Creek. However, due to fisheries concerns, this bridge is the preferred option in order to minimize potential fisheries impact.

The proposed bridge is a structure that would be designed to cross the creek and decrease impacts to the stream banks and channel bed and fisheries. Therefore, it cannot be moved outside the RHCA because to do so would place it in an area where a bridge is not necessary. While use of the bridge is not required to access mining sites 1, 2, and 3, use of the bridge by the miner would decrease how often the existing ford would be used and thus decrease potential impacts on fisheries (*See Chapter 3, Fisheries Section*).

2. Alternative 2

The installation and removal of the proposed ATV bridge would NOT be in compliance with MM-2 as it pertains to streams because

- a) Potential impact to water quality for the reasons listed in #3 below.
- b) Potential impact to inchannel complexity for the reasons listed in #3 below.
- c) No impacts to channel morphology because the bridge would be located at the ford to Clear Creek where the stream banks are already impacted. Therefore, there would be no new impact to stream banks and no change from existing channel width/depth ratios.

However, the installation and removal of the proposed ATV bridge would be in compliance with MM-2 as it pertains to activity inside the RHCA because

- d) No new detrimental soil disturbance because the bridge would be located at the existing ford.
- e) No impact to the riparian vegetation for the same reasons noted for 2c.

Alternative 3

Under Alternative 3, the installation and removal of the proposed ATV bridge would now be in compliance with MM-2 as it pertains to streams for the reasons listed in #3 below.

The installation and removal of the proposed ATV bridge would still be in compliance with MM-2 as it pertains to activity inside the RHCA for the same reasons listed for Alternative 2.

3. Alternative 2

Potential for a discharge because the ford approaches are unvegetated and fine grained. The placement and removal of the bridge would result in stream bank sediment entering the Clear Creek.

In addition, the miner proposes to leave the bridge in place over the winter months. As the stream flows through forest, there is large wood in the stream and during the spring high flows, some of this wood moves. Therefore, there is the potential for large wood to pile up behind the bridge, create a dam and blow out the bridge. This would result in the input of non-native material and potential impacts downstream in inchannel complexity.

Alternative 3

Discharge potential **would be eliminated** because of the addition of two Forest Service site-specific WRPMs. One WRPM would require that the ford approaches to Clear Creek would be rocked and sloped. This WRPM would eliminate the sediment source by protecting the stream banks. The second WRPM would require that the bridge be removed in the late fall to prevent it from acting as a barrier in the spring to wood moving downstream. This would eliminate concerns related to wood potentially piling up behind the bridge during high spring flows and blowing out the bridge.

- 4. Conclusions vary as a function of alternative. Forest Service site-specific WRPMs for the temporary ATV bridge are added to Alternative 3. These WRPMs bring the use of the bridge into compliance under Alternative 3 with respect to MM-2 by eliminating the potential for a discharge and changes to inchannel complexity.

Sunshine/McWillis (Placer)

Site visited by district hydrologist on October 28, 2010 (Field book 4) and October 3, 2012 (Field book 10) and by Chris Helberg (Mineral Administrator, UNF) on October 3, 2012.

Structures related to the Sunshine/McWillis operation that were evaluated for compliance with MM-2 are 1) existing ponds at Processing site 1, 2) proposed pond at Processing site 2, 3) one FS decommissioned road, 4) one existing temporary access road, and 5) existing bridge. The miner also proposes to use a FS closed road but this road is outside the RHCA. Therefore, it is not discussed in this section.

Plan information

All process water is contained in the ponds and there would be no discharge of process water. The main process ponds are approximately 20'x30'x10' in size, the secondary site has smaller ponds, approximately 8'x10'x4' in size. Both sets of ponds are located over 30 feet from McWillis Gulch. These are pit type ponds without dams (p. 3).

Source of processing water to be used at Processing Site #1 = Groundwater. There is no connection between the ponds and McWillis Gulch.

Source of processing water to be used at Processing Site #2 = Plan states groundwater but the pond is in the channel of McWillis Gulch.

Field observations

Site is located in McWillis Gulch with is tributary to Olive Creek. McWillis Gulch is an intermittent, non-fish bearing stream. RHCA = 100 ft/side because in a priority watershed. It has been historically hydraulically mined. A 90-foot long culvert connects McWillis Gulch to Olive Creek and the culvert is a fish barrier. Total valley bottom width is 150 feet at most. The gulch is less than 100 feet wide between creek and hillslope where the ponds are located.

Pond-specific information

The ponds are existing and inside the RHCA of McWillis Gulch.

Processing site 1: Three existing ponds observed.

Pond 1 would be the source water pond. It has water and is in McWillis Gulch. The gulch was historically placer mined in this area and the creek/gulch is not well defined at this point. Old tailings piles are present.

Pond 2 is the primary settling pond. This pond is 10 to 12 feet from McWillis Gulch. It is about 7.5'x 10'x 5' deep and had a small amount of water in 2012.

Pond 3 is the overflow settling pond. It is a long pond that may have been part of an old ditch. This pond is up off the drainage along the hillside and not connected to the drainage. It was dry when visited in 2012.

Processing site 2: This site is downstream of Processing site 1 and less distinct. A small depression was noted in the creek on the south side of the channel in the area of Worksite 2. This may be the other processing site. This depression is in old placer tailings.

Road-specific information

Miner proposes to use one Forest Service closed road (1305-054), one Forest Service decommissioned road (1305-130) and one existing temporary access road (1305-M1a) to access the various sites (Appendix 6). All are native surface roads.

The closed Forest Service road (1305-054) is more than 100 feet from the gulch and outside the RHCA. The intervening ground is well vegetated with grasses, forbs, needles, and downed wood. It is not discussed further.

The decommissioned Forest Service road (1305-130) leaves the closed road and is used to access the cabin area. It is inside the RHCA. Distance between the road and the gulch varies but is more than 50 feet from the gulch at its closest. The intervening ground cover is 100 % and composed of grasses, forbs, needles, and downed wood.

The existing temporary access (TA) road (1305-M1a) is on flat ground, parallels the gulch, and crosses the gulch at a bridge. It is inside the RHCA. The intervening ground cover is a mix of riparian shrubs, grass, forbs, and needles. Road lengths are: closed FS road 1305-054 = 0.4 miles; decommissioned FS road 1305-130 = 0.45 miles; TA 1305-M1a = 0.18 miles.

Bridge-specific information

Miner proposes to use an existing wooden bridge to cross McWillis Gulch for both heavy equipment and vehicle traffic. No fording is required. The bridge is stable.

Pond-specific Conclusions

Processing site 1

1. The existing source water pond and the existing settling ponds should not be moved outside the RHCA because the valley bottom width on the side where the ponds are located is less than 100 feet which would place the ponds on the hillslope in old placer tailings. The hillslope soils are old tailings and the ponds would receive limited groundwater inputs. In contrast, the existing ponds are dug into flat ground, in a highly stable location, and Ponds 1 and 2 receive some groundwater.

2. Ponds 1 and 3

Ponds 1 and 3 would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because

- a) No impacts to water quality for the reasons listed in #3 below.
- b) No impacts to inchannel complexity or channel morphology because the ponds are not in the channel. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
- c) No new soil disturbance because they are existing ponds.
- d) No impact to the riparian vegetation because there isn't any where the ponds are located.

Pond 2

Alternative 2

The use of settling pond 2 would NOT be in compliance with MM-2 as it pertains to streams because

- a) Potential impact to water quality for the reasons listed in #3 below.
- b) No impacts to inchannel complexity or channel morphology under either alternative because the pond is not in the channel. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.

However, use would be in compliance with MM-2 as it pertains to activity inside the RHCA because

- c) No new soil disturbance because it is an existing pond.
- d) No impact to the riparian vegetation because there isn't any riparian vegetation around the pond.

Alternative 3

Use of Pond 2 as it pertains to streams would now be in compliance with MM-2 as a result of the addition of a Forest Service site-specific WRPM for the reasons listed in #3 below.

Use would still be in compliance with MM-2 as it pertains to activity inside the RHCA for the reasons noted under Alternative 2.

3. *Pond 1 (Source water Pond)*

No potential for a discharge via surface flow from this pond under either alternative because it would only be withdrawing water.

Pond 2 (primary settling pond)

Alternative 2

Potential for a discharge because there is a low spot in the pond where water and sediment could exit and enter the drainage rather than enter the pipe that connects settling Ponds 2 and 3. Sediment would then have the potential to move downstream into Olive Creek during the spring runoff period.

Alternative 3

Discharge potential **would be eliminated** as a result of the addition of a Forest Service site-specific WRPM which requires that the low spot be bermed. The berm would ensure that Ponds 2 and 3 are connected and overflow from Pond 2 enters Pond 3.

Pond 3 (overflow settling pond)

No potential for a discharge via surface flow under either alternative because this pond is not directly connected to the drainage. It is the overflow settling pond and the amount of water it is expected to receive is limited.

4. Conclusions differ as a function of alternative. One Forest Service site-specific WRPM is added to Alternative 3. This WRPM brings the use Pond 2 at Processing site #1 into compliance under Alternative 3 with respect to MM-2 by berming Pond 2. The berm eliminates the potential for a discharge of sediment into McWillis Gulch and eventually Olive Creek during the spring flows.

Processing site 2

1. The pond could not be moved outside the RHCA because the valley width is less than 100 feet wide total. The result is that this pond would end up on the hillslope in old placer tailings. The pond would receive limited groundwater inputs. However, this pond is NOT required for the miner to process material. Processing site #1 is close enough to easily access.

2. **Alternative 2**

Use of the pond would NOT be in compliance with MM-2 as it pertains to streams because

- a) Potential to alter existing water quality for the reasons listed in #3 below.
- b) No impacts to inchannel complexity under either alternative because the pond is existing and in old placer tailings.
- c) No impacts to channel morphology under either alternative, even though the pond is in the channel, because the pond is existing and stable. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.

However, use of the pond would be in compliance with MM-2 as it pertains to activity inside the RHCA because

- d) No new detrimental soil disturbance because it is an existing depression in old placer tailings.
- e) No impact to the riparian vegetation because the pond is existing and in old tailings. Riparian vegetation in the depression is absent.

Alternative 3

Processing would be restricted to Processing site #1. Therefore, the question of compliance with MM-2 for Processing site 2 would no longer applies.

3. **Alternative 2**

Potential for a discharge via surface flow into McWillis Gulch from use of *Processing site #2* because the pond is a shallow depression and seasonally become part of the channel. Therefore, sediment that is put into the pond will be mobilized during spring high flows and transported downstream to Olive Creek. There is no potential for a discharge via subsurface flow because the pond is already dug into the channel.

Alternative 3

Discharge potential **would be eliminated** as a result of a Forest Service site-specific WRPM that restricts processing to Processing site #1.

- 4. Conclusions differ as a function of alternative. A Forest Service site-specific WRPM is added to Alternative 3. This WRPM eliminates use of Processing site #2 and therefore the potential for a discharge of sediment into McWillis Gulch that could locally influence water quality in Olive Creek.

Road-specific Conclusions

1. Use of the decommissioned FS road (1305-130) and the one TA road (1305-M1a) is required in order to access the sites which are inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Use of the one Forest Service decommissioned road and one existing TA road would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the roads are not in the stream. The FS decommissioned road is more than 50 feet from the gulch and the TA road crosses the gulch via a bridge. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because they are existing roads.
 - d) No impact to the riparian vegetation because the roads are existing and do not cross riparian areas except at the bridge.
3. No potential for a discharge from use of the roads because they are separated from the creek by 50 feet or more of ground that is well-vegetated by grasses, forbs, needles, and downed wood and/or riparian shrubs and/or old mine tailings. The ground cover and distances are effective sediment trapping mechanisms and would capture any sediment that leaves the roads prior to it reaching the gulch.
4. Conclusions are the same regardless of alternative.

Bridge-specific Conclusions

1. The existing bridge is a structure that is designed to cross a creek and decrease impacts to the stream banks and channel bed. Therefore, it cannot be moved outside the RHCA because to do so would place it in an area where a bridge is not necessary. The bridge is required to access the mining sites.
2. Use of the bridge inside the RHCA would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the bridge is not in the stream.

- c) No impacts to channel morphology because the bridge is existing, stable and spans the creek. Therefore, there would be no new impacts to stream banks and no change to width/depth ratios.
 - d) No new soil disturbance because the bridge is existing.
 - e) No impact to the riparian vegetation because the bridge is existing.
3. No potential for a discharge from use of the bridge because it is existing and stable and no modifications are planned.
4. Conclusions are the same regardless of alternative.

Tetra Alpha Placer

Site visited by district hydrologist on August 25, 2010 (Field book 5) and September 9, 2011 (Field book 6) and October 19, 2011 (photos only).

Structures related to the Tetra Alpha Placer operation that were evaluated for compliance with MM-2 are 1) an existing pond (used as source water and settling pond), 2) one FS closed road, 3) one existing temporary access road and 4) four proposed TA roads.

Plan information (2007)

Water from the operation will be pumped from the existing ponds... Only small amount of makeup water will be pumped from Boulder Creek (p. 5).

There is a letter dated July 20, 2011 from Mr. Nazer to Jeff Tomac, WhiTAn District Ranger, providing clarification to the Tetra Alpha Placer. Letter includes an aerial photo showing the location of the pre-existing placer processing area, the location of the three fords, and the two areas to be mined.

Source of processing water = Groundwater in the pond and make up water from Boulder Creek. There is no surface connection between the pond and Boulder Creek.

Field observations

Boulder Creek is perennial and fish-bearing. RHCA = 300 ft/side. Valley width is between creek and hillslope in the area of the processing site is less than 300 feet.

Pond-specific information

The existing Tetra Alpha Placer pond is located inside the RHCA of Boulder Creek and would serve as both the source water pond and the settling pond. The pond is large and horseshoe shaped. It is 110 feet from the creek and separated from the creek by a wet meadow that has very lush grasses and sedges and rushes. The pond is elevationally above the meadow but there is no overflow point into the meadow.

Road-specific information

Miner proposes to use one Forest Service closed road, one existing temporary access (TA) road and four proposed TA roads (Appendix 6). All are native surface roads.

Forest Service closed road 7355-011

This existing closed FS road would be used to access the placer processing site and serves as the starting point for the roads that access the two mining areas. The road is inside the RHCA. The road is within 50 feet of the creek in places. Once it reaches the processing site the distance to the creek increased to more than 200 feet. The intervening ground is composed of lush grasses and forbs. Road length is 0.72 miles.

TA road 7355-M3a

This existing TA road would be used to access a portion of the Stage 1 mining area. The road is inside the RHCA. Road length is 0.27 miles.

Proposed TA road 7355-M3b

This proposed road would be a two-track mine access road that would be used to access the upper portion of the Stage 1 mining area. The road is inside the RHCA. The road would be separated from the creek by about 50 feet of vegetated ground that is a mix of downed wood, grasses, needles and forbs. Road length is 0.06 miles.

Proposed two-track TA roads 7355-M3c and M3d (except meadow portion of M3d)

These proposed roads would be used to access the Stage 2 area. All are inside the RHCA. TA 7355-M3d crosses the meadow for about 350 feet. This section of M3d is referred to as M3d (meadow section) for analysis purposes.

M3c and M3d, except the meadow portion, would occur about 25 feet from the edge of the meadow on the hillslope. The ground cover in the meadow is lush grasses, forbs and sedges and the ground cover on the hillslope is needles, grasses, forbs, and downed wood. Road lengths are: TA road 7355-M3c = 0.03 miles; TA road 7355-M3d = 0.02 miles.

The meadow portion of M3d would create a two-track across the meadow. The meadow has lush grasses, forbs and sedges. The road would cross Boulder Creek at a designated ford yet to be determined.

Pond-specific Conclusions

1. The existing source water/settling pond should not be moved outside the RHCA for the following reasons. If the pond is moved outside the RHCA it would be on the hillslope because the valley bottom width between the creek and hillslope, in the area of the pond, is less than 300 feet. A hillslope pond would be new construction and therefore new disturbance. The hillslope soils are shallow and the pond would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing pond is dug into flat ground, which is a highly stable location, and receives some groundwater.
2. Use of the source water/settling pond would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impact to existing water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity or channel morphology because the pond is not in the channel. It is more than 50 feet from the creek. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - c) No new soil disturbance because it is an existing pond.
 - d) No impact to the riparian vegetation because the pond is more than 50 feet from Boulder Creek. In addition, there would be no impact to the riparian vegetation that has developed in the pond because only processing water will be discharged into it.
3. *Source water pond*

No potential for discharge into Boulder Creek under either alternative when the existing pond is used as a source water pond because would only be withdrawing water.

Settling pond

No potential for discharge via surface flow into Boulder Creek under either alternative when the existing pond is used as a settling pond because the pond has a large capacity, is dug into the ground and is in a stable location. Between the creek and pond is a wet meadow with lush vegetation.

No potential for a discharge via subsurface flow into the creek under either alternative when used as a settling pond because pond is dug into fine sediments and the pond is separated from the creek by more than 100 feet.

4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

Forest Service closed road 7355-011

1. Use of the existing FS road is required in order to access the sites which are within the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.
2. Use of the Forest Service closed road would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the road is not in the stream and separated from Boulder Creek by at least 50 feet of well vegetated ground. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because it is an existing road.
 - d) No impact to the riparian vegetation because it is an existing road. The road parallels Boulder Creek but does not enter into the riparian areas.
3. No potential for a discharge related to use of this road because 1) the distance between the creek and the road varies from 50 to more than 200 feet and 2) the intervening ground is composed of lush grasses and forbs. This ground cover type and distance would effectively trap any sediment that exits the road and prevent it from reaching the creek.
4. Conclusions are the same regardless of alternative.

Existing Temporary Access (TA) Road 7355-M3a

1. Use of the existing TA road would be required in order to access the sites which are within the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.
2. Use of the existing TA access road would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.

- b) No impacts to inchannel complexity or channel morphology from road use because the road is along the base of the hillslope and separated from the creek by 50 feet and old placer tailings. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because it is an existing road.
 - d) No impact to the riparian vegetation because the road is existing and located at the base of the hillslope on the south side of the creek where there isn't any riparian vegetation.
3. No potential for a discharge into Boulder Creek as a result of using this road under either alternative because the road is separated from the creek by tailings piles.
4. Conclusions are the same regardless of alternative

Proposed TA Roads EXCEPT the meadow portion of 7355-M3d

1. Use of the proposed TA roads 7355-M3b, M3c, and M3d roads is required in order to access the sites which are within the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Construction and use of these proposed TA roads would be in compliance with MM-2 under both alternatives as it pertains to streams because
- a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the roads are not in the stream and separated from Boulder Creek by at least 25 feet. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.

Construction and use of these proposed TA roads would NOT be in compliance with MM-2 under Alternative 2 as it pertains to activity inside the RHCA because

- c) New detrimental soil disturbance would occur. There are no provisions in the Plan to minimize disturbance necessary for access or ensure that these newly constructed two-tracks are obliterated and revegetated.
- d) No impact to the riparian vegetation for the reasons noted for 2b.

Under Alternative 3, these roads **would be in compliance** with MM-2 as it pertains to activity inside the RHCA for the reasons listed in #3 below.

3. TA road 7355-M3b

No potential for a discharge into Boulder Creek as a result of creation and use of this road under either alternative because the road would be separated from the creek by about 50 feet of vegetated ground that is a mix of downed wood, grasses, needles and forbs. This ground cover would be effective at trapping any sediment that might exit the road and prevent it from reaching the creek.

TA roads 7355-M3c and 7355-M3d (except meadow portion of M3d)

No potential for a discharge into Boulder Creek as a result of creation and use of these two roads under either alternative because 1) they would occur about 25 feet from the edge of the meadow on the hillslope and 2) the ground cover between the creek and the road is lush grasses, forbs and sedges in the meadow and needles, grasses, forbs, and downed wood on the hillslope. This ground cover would effectively trap any sediment generated by construction and use of these two roads and prevent it from reaching Boulder Creek.

In addition, the concerns related to the creation of new roads, as it pertains to activity inside the RHCA, would be eliminated because of the addition of Forest Service General Requirements R13 and Z 1-14 (Appendix 2). These requirements bring construction and use of these roads into compliance under Alternative 3 with respect to MM-2 by ensuring that the roads are obliterated and closed once mining is completed.

4. Conclusions vary as a function of alternative as a result of the addition of Forest Service General Requirements R-13 and Z-14 (Appendix 2) under Alternative 3 which being construction and use of these roads into compliance with MM-2.

Proposed TA Road 7355-M3d (meadow portion)

1. Use of the proposed meadow portion of M3d is required in order to access the Stage 2 area which is within the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.
2. Under Alternative 2, construction and use of this proposed temporary access road would NOT be in compliance with MM-2 as it pertains to streams or activity inside the RHCA because
 - a) Potential impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity from road construction and use because the road would not be in the stream except at the designated ford.

- c) Local impact to channel morphology at the ford site because this would be a new ford that would require changes in the stream banks. The banks would need to be laid back. Therefore, there would be no impacts to stream banks and no change to width/depth
- d) New detrimental soil disturbance would occur. There are no provisions in the Plan to minimize disturbance necessary for access or ensure that these newly constructed two-tracks are obliterated and revegetated.
- e) Local impacts to the riparian vegetation in the areas where the new two-track would cut through the meadow and cross the stream.

Under Alternative 3, road creation and use **would be in compliance** with MM-2 as it pertains to streams and activity inside the RHCA because discharge potential **would be eliminated** for reasons noted in #3 below. Concerns related to detrimental soil disturbance would be eliminated as a result of the addition of Forest Service General Requirements R13, and Z-1 through 14 (Appendix 2). The requirements would also ensure that the road was obliterated and revegetated when mining was completed.

3. Under Alternative 2, there would be the potential for a discharge as a result of creation and use of this road in the vicinity of the creek because the meadow sediments are fine grained and have a high potential to rut. The ruts would channel water and could convey the exposed road sediment into the creek because the road would cross the creek and create a new ford. The ford approaches would be composed of fine sediment which have the potential to erode into the creek.

Under Alternative 3, the discharge potential **would be eliminated** related to the creation and use 7355-M3e because of the addition of a Forest Service site-specific WRPM and Forest Service General Requirements Z1-14 and R13. The WRPM would require that the portion of the road that is within 25 feet of the creek be rocked. Rocking would eliminate the sediment source and thus prevent a discharge. The General Requirements would further minimize the discharge potential by minimizing the amount of new soil disturbance and requiring that the road be obliterated and revegetated when mining was completed.

4. Conclusions vary as a function of alternative. Forest Service site-specific WRPMs and General Requirements are added to Alternative 3 for this road. These requirements bring construction and use of this two-track road into compliance under Alternative 3 with respect to MM-2 by eliminating the potential for a discharge, minimizing the amount of new soil disturbance, and ensuring that the road is obliterated and revegetated.

Tetra Alpha Mill and Lode

Site visited by district hydrologist on October 27, 2004 (Field book 3) and August 25, 2010 (Field book 5).

Structures related to the mill site that were evaluated for compliance with MM-2 are 1) existing source water pond, 2) existing settling ponds (dry depressions), 3) one FS closed road, and 4) two existing temporary access roads (TA roads 7355-M4a and M4b).

TA road 7355-E1a which is used to access the Lode adit is outside the RHCA and not discussed further with respect to compliance with MM-2.

Plan information (1996)

Ponds will be constructed in the area already impacted by mining years ago. Water will be recycled to a degree, however, a second set of ponds may be necessary.... Settling ponds will be long and narrow and constructed as far from Boulder Creek as possible (p.3).

Water for milling will come from the Last Chance reservoir or from Boulder Creek. The mill site is for the Lode part of this operation (p.5).

Source of processing water = Last Chance reservoir or Boulder Creek.

Field observation

Pond-specific information

The source water pond is an inchannel pond that exists as a result of Last Chance Creek being historically bermed along its length and becoming a series of ponds. The pond is located by the mill site. The existing pond proposed for use is only connected to Boulder Creek via subsurface flow. The source water pond and the existing settling ponds are located inside the RHCA of Boulder Creek, a perennial fish-bearing stream. RHCA = 300 ft/side.

FS NOTE: Tetra Alpha Mill Plan, dated 1996, indicates that it will be constructing up to two sets of ponds. However, the settling ponds have already been constructed and are located between the road and the hillslope. The creek is on the other side of the road. The settling ponds are dug into the ground.

Road-specific information

Mill Site

Forest Service road 7355-011 is a closed road and is used to access the mill site. The road is within 50 feet of the creek and inside the RHCA of Boulder Creek. The intervening ground is composed of lush grasses and forbs. Road length is 0.31 miles.

Temporary Access (TA) road 7355-M4a is an existing, native surface road and used to access the mill site. Road is 140 feet from Boulder Creek and is separated from the creek by FS 7355-011 road and 56 feet of vegetated ground between the two roads. Road is inside the RHCA. Road length is 0.05 miles.

TA road 7355-M4b is an existing native surface road used to access the mill site. Road varies between 50 and 140 feet from Boulder Creek. It connects FS 7355-011 and TA road 7355-M4a. Road is inside the RHCA. Road length is 0.03 miles.

Lode adit

TA road 7355-M5a is an existing native road and used to access the lode. Road is more than 300 feet from Boulder Creek and outside the RHCA. It is not discussed further with respect to compliance with MM-2. Road length is 0.01 miles.

Pond-specific Conclusions

1. The existing source water pond and the settling ponds should not be moved outside the RHCA for the following reasons. The valley width is narrow near the mill and if the ponds were moved outside the RHCA they would be on the hillslope. Hillslope ponds would be new construction and therefore new disturbance. The hillslope soils are shallow and the ponds would receive limited groundwater inputs. When filled (e.g. in the spring) there would be the potential for a pond failure and hillslope erosion. In contrast, the existing pond is dug into flat ground, which is a highly stable location and separated from the creek by the access road. They receive some groundwater.

Source water pond

2. The source water pond would be in compliance with MM-2 under both alternatives because water would only be withdrawn from the pond. Therefore, there would be no impacts to water quality, inchannel complexity, channel morphology, soils or riparian vegetation.
3. No potential for a discharge because only withdrawing water from an existing pond.
4. Conclusions are the same regardless of alternative.

Settling Ponds

2. Under Alternative 2, use of the settling ponds would NOT be in compliance with MM-2 as it pertains to streams because
 - a) Local impact to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity because the ponds are not in the channel.

- c) No impact to channel morphology because the ponds are at least 50 feet from the creek and separated from the creek by FS 7355-011. Therefore, there would be no impact to stream banks and no change in channel width/depth ratios.

However, use of the settling ponds would be in compliance with MM-2 as it pertains to activity inside the RHCA because

- d) No new soil disturbance because they are existing ponds.
- e) No impact to the riparian vegetation because the ponds are existing and there isn't riparian vegetation in the ponds. In addition, the ponds would only receive processing water.

Under Alternative 3, the use of the settling ponds would be in compliance with MM-2 because the potential to alter the existing water quality **would be eliminated** for the reasons listed in #3 below.

3. **Alternative 2**

Surface flow: No potential for discharge via surface flow into Boulder Creek because the ponds have a large capacity, are dug into the ground and separated from the creek by the mine access road.

Subsurface flow: Potential for a discharge of heavy metals in the waste rock to move through the road fill **via subsurface flow** of and into the creek.

Alternative 3

Surface flow: No potential for discharge via surface flow into Boulder Creek because the ponds have a large capacity, are dug into the ground and separated from the creek by the mine access road.

Subsurface flow: Discharge potential of heavy metals via subsurface flow **would be eliminated** because of the addition of Forest Service General Requirements L1 – L11 related to lode mining. The Lode General Requirements address the concerns related to heavy metals. For example, L-5 requires that the first run of adit ore be tested for heavy metals (L-5). If heavy metals were present and above the State standards, then operator would have to amend his plan and it would be reevaluated. As a result no material would go into the pond if it tested for heavy metals.

- 4. Conclusions differ as a function of alternative. Forest Service General Requirements related to lode mining are added to Alternative 3. These requirements bring use of the ponds into compliance under Alternative 3 with respect to MM-2 by eliminating the potential for a discharge of heavy metals as a result of use of the settling ponds.

Road-specific Conclusions

Lode adit

TA road 7355-M5a is an existing native road and used to access the lode. It is more than 300 feet from Boulder Creek and outside the RHCA. Therefore, the question of compliance with MM-2 does not apply.

Mill Site

1. Use of this existing close Forest Service road and TA roads is required in order to access the site which is located inside the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.
2. Use of these roads would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the road is not in the stream and separated from Boulder Creek by about 50 feet. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because it is an existing road.
 - d) No impact to the riparian vegetation for the same reasons noted for 2b.
3. *Forest Service closed road 7355-011*

No potential for a discharge related to use of FS 7355-011 because 1) the distance between the creek and the road varies from 50 to 68 feet and 2) the intervening ground is composed of lush grasses and forbs. This ground cover type and distance would effectively trap any sediment that exits the road and prevent it from reaching the creek.

TA 7355-M4a

No potential for a discharge related to use of TA 7355-M4a because 1) the distance between the creek and the road is 140 feet, 2) separated from the creek by FS 7355-011, and 3) the ground between the two roads is well vegetated. This ground cover type, FS 7355-011, and distance would effectively trap any sediment that exits the road and prevent it from reaching the creek.

TA 7355-M4b

No potential for a discharge related to use of TA 7355-M4b because 1) the distance between the creek and the road is between 50 and 140 feet, and 2) merges into FS 7355-011. FS 7355-011 and the distance between FS 7355-011 and the ground cover would effectively trap any sediment that exits TA 7355-M4b and would prevent it from reaching the creek.

4. Conclusions are the same regardless of alternative.

Troy D (Placer)

Site visited by district hydrologist on November 4, 2004 (Field book 4) and October 11, 2010 (Field book 5).

Structures related to the Troy D operation that were evaluated for compliance with MM-2 are 1) one pond which would be used as both a source water pond and a settling pond, 2) two existing temporary access (TA) roads.

Plan information

The ponds are located are located over 100' from Granite Creek.... Ponds will be periodically cleaned of silt....(p.3).

At least two ponds 20'x15'x10' will be used to settle/recycle water. Ponds exist presently (p.5).

Source of processing water = Groundwater. Dredge ponds are elevationally above and distant from Granite Creek. There is no surface connection to Granite Creek.

Field observations

Granite Creek is perennial and fish-bearing. RHCA = 300 ft/side. Valley bottom width on north side of Granite Creek between the creek and County Road 24 is less than 300 feet.

Pond-specific information

Two existing ponds are located inside the RHCA of Granite Creek (Pond A and Pond B). The ponds are old dredge ponds and about 136 feet from the creek, dug into the old tailings and behind the high berms of old placer tailings that line the banks of Granite Creek. Pond A is large, has cattails and standing water. Pond B is much smaller. Both ponds would be used as settling ponds. While not stated in the Plan, one of the ponds, likely Pond A, would also be used as the source water pond.

Road-specific information

Miner proposes to use two existing temporary access (TA) roads (Appendix 6). They are both within the RHCA. They are composed of old placer tailings and fines are limited. The roads are more than 136 feet from the creek, on flat ground and behind the old tailings berm. TA road lengths are: 1000-E4a = 0.05 miles; 1000-E4b = 0.11 miles

Pond-specific Conclusions

1. The two existing source water/settling ponds should not be moved outside the RHCA because the ponds would be on the other side of County Road 24 away from the site and outside the claim.
2. Under Alternative 2, use of the existing source water/settling ponds would NOT be in compliance with MM-2 as it pertains to streams because
 - a) Impacts to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity because the ponds are not in the channel.
 - c) No Impact to channel morphology because the ponds are at least 136 feet from the creek and therefore there would be no impact to stream banks and no change in channel width/depth ratios.

However, use of the existing source water/settling ponds would be in compliance with MM-2 under both alternatives as it pertains to activity inside the RHCA because

- d) No new detrimental soil disturbance, despite being new construction, because it would be located in an area that has been previously mined. This area has very little ground vegetation.
- e) No impact to the riparian vegetation because there isn't any in the area surrounding the pond. The riparian vegetation that has developed in the pond would not be impacted because no activity is proposed for the pond except discharging processing water..

Under Alternative 3, use of the ponds would be in compliance with MM-2 because the addition of Forest Service site-specific WRPMs **would eliminate** the potential to impact water quality for the reasons listed in #3 below.

3. Under Alternative 2, potential for a discharge via subsurface flow from the ponds into the creek because 1) the ponds are in old placer tailings which may have a high permeability and large pores allowing both sediment and water to move through the subsurface, 2) are

elevationally above the creek which would result in flow towards the creek and 3) have water in the larger pond indicating groundwater flow through the ponds.

No potential for a discharge via surface flow from the proposed ponds into Granite Creek under either alternative because the ponds are dug into the ground and are separated from the creek by approximately 136 feet and a berm of old tailings that line the creek.

Under Alternative 3, discharge potential via subsurface flow **would be eliminated** as a result of the addition of two Forest Service site-specific WRPMs. One WRPM would designate Pond A (the larger pond) as the source water pond and Pond B as the settling pond. The other WRPM addresses the potential for a discharge from Pond B. This WRPM **would eliminate** the potential for a discharge by creating a buried barrier between the pond and the stream that would prevent pond sediment moving via groundwater to the stream bank.

4. Conclusions differ as a function of alternative. Two Forest Service WRPMs are added to Alternative 3. These WRPMs bring use of the existing ponds into compliance under Alternative 3 with respect to MM-2 by eliminating the potential for a discharge as a result of pond related activity.

Road-specific Conclusions

1. Use of these existing TA roads is required in order to access the site which is located inside the RHCA. Therefore, they cannot be moved out of the RHCA without eliminating site access.
2. Use of the two existing temporary access roads would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the road is not in the stream and separated from Granite Creek at least 136 feet of flat ground and a high berm of old tailings. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because they are existing roads.
 - d) No impact to the riparian vegetation because the road is existing and crosses old tailings. There isn't any riparian vegetation in this area.
3. No potential for a discharge from use of the roads under either alternative because they are more than 136 feet from the creek, on flat ground, behind the old tailings berm, and have very limited fines. Topography, the berm and the flat ground are very effective at trapping any sediment that left the road and preventing it from reaching the creek.

4. Conclusions are the same regardless of alternative.

Yellow Gold (Placer)

Site visited by district hydrologist on July 6, 2004 (Field book 1).

Structures related to the Yellow Gold operation that were evaluated for compliance with MM-2 are 1) an existing source water pond, 2) proposed settling ponds, 3) five Forest Service closed roads, 4) one existing temporary access (TA) road, and 5) a proposed foot bridge.

Plan information

....water for processing is supplied by an existing reservoir located in Last Chance Creek. Three off-channel ponds located approximately 100 feet from Last Chance Creek, each about 20'x15'x10' are used in the operation... Process ponds are pit-type ponds with low 2-3' dams and are 100' from the creek...Water in the ponds slowly evaporates until late fall when it is gone (p.7).

Water is recycled out of the off-channel ponds... Water is brought from the reservoir to the settling ponds via firehouse or a plastic or metal pipeline (p. 9).

Field observations

Last Chance Creek has been historically mined and bermed in multiple places. As a result the creek is now a series of ponds. Flow is perennial but NOT fish-bearing. RHCA = 100 ft/side. Total valley bottom width (hillslope toe to hillslope toe) is less than 150 feet.

Source of processing water = Surface water that is ponded in Last Chance Creek as a result of the berm and possibly some groundwater.

Pond-specific information

The Last Chance pond is the result of a berm across the stream and would be used as the source water pond. It is inside the RHCA. A wetland is forming upstream of the pond.

The settling ponds mentioned in the Plan and shown on the miner's sketch as existing, however, were not found in 2004. The miner's sketch shows the word "ponds" downstream of the reservoir and on the west side of the creek. Chris Helberg (Minerals Administrator) and Allison Johnson (Fisheries Biologist) also did not find these ponds when they visited the site in 2010. Therefore, the settling ponds could not be found and therefore are treated as "proposed".

Road-specific information

Miner proposes to use five Forest Service closed roads and one existing temporary access (TA) road (Appendix 6). They are all native surface roads. All of the roads are within the RHCA.

All Forest Service closed roads are separated from the creek by at least 35 feet (and in most cases much more) with the intervening ground cover is a mix of needles, grasses, forbs and downed wood. FS closed road lengths are: 7355-025 = 0.05 miles; 7355-026 = 0.11 miles; 7355-050 = 0.61 miles, 7355-055 to junction with 7355-050 = 0.37 miles.

TA road 7355-E2a: This is an existing two-track road that makes its way down to Last Chance Creek and a portion of the area to be mined. The two-track is separated from Last Chance Creek by 35 or more feet and the intervening ground cover is a mix of grasses, forbs, and downed wood. Road length is 0.11 miles

Bridge-specific information

The miner proposes to install a foot bridge each season so that the miner can walk over to the processing site. It will be a board or plank of wood. The foot bridge is inside the RHCA.

Pond-specific Conclusions

Source Water Pond

1. The source water pond is existing and should not be moved outside the RHCA for the following reasons. The valley width is narrow and if the source water pond was moved outside the RHCA it would be on the hillslope. The pond would be new construction and therefore new disturbance. The hillslope soils are shallow and groundwater inputs would be limited. In contrast, the existing pond, which is part of Last Chance Creek, is stable and contains water year round.
2. Use of the source water pond would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impact to inchannel complexity, despite the pond being in the channel, because water would only be removed. No activity in the pond is proposed.
 - c) No impact to channel morphology because the pond is existing and no activity is proposed for this pond except to remove water for processing. Therefore there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) No new soil disturbance because it is an existing pond.

- e) No impact to the riparian vegetation which is present in the pond because this is a source water pond only and no activity, except withdrawing water, is proposed.
- 3. The source water pond is part of Last Chance Creek and it would only be used as a clean water source. Therefore, no potential for a surface or subsurface discharge into Last Chance Creek under either alternative.
- 4. Conclusions are the same regardless of alternative.

Settling Ponds

- 1. The location of the settling ponds is currently unknown and could not be evaluated under Alternative 2.
- 2. Under Alternative 2, a determination of compliance with MM-2 **could not be made** because the miner did not provide the location of the ponds.

Under Alternative 3, the construction and use of the ponds would be in compliance with MM-2 as it pertains to streams and activity inside the RHCA as a result of the addition of a Forest Service site-specific WRPM and FS General Requirement R-15. With these additions,

- a) No potential for a discharge for the reasons listed below in #3.
 - b) No impacts to to inchannel complexity because the settling ponds would not in the channel as a result of the Forest Service WRPM.
 - c) No impact to channel morphology because the ponds would be located away from the stream banks as part of Forest Service site-specific WRPM discussed in #3 below. Therefore, there would be no impact to stream banks and no change in channel width/depth ratios.
 - d) Minimal amount of new detrimental soil disturbance necessary to meet miner's needs as a result of FS site-specific WRPM and FS General Requirement R-15 (Appendix 2) discussed in #3 below.
 - e) No impact to the riparian vegetation or only the minimum necessary as a result of the two Forest Service requirements..
- 3. Under Alternative 2, the "potential for a discharge" assessment **could not be made** because the miner did not provide site locations.

Under Alternative 3, no potential for discharge via surface or subsurface flow from construction and use of the ponds because a Forest Service site-specific WRPM (Appendix 1A) and General Requirement R-15 are added. The site-specific WRPM requires that the

ponds be located, constructed, and protection measures implemented with input from the district hydrologist and the mineral administrator. General Requirement R-15 would ensure that the ponds were properly reclaimed once mining activity was over.

4. Conclusions differ as a function of alternative. A Forest Service WRPM and FS General Requirement are added to Alternative 3. These additional requirements bring the Plan into compliance under Alternative 3 with respect to MM-2 by eliminating the potential for a discharge via surface or subsurface flow into Last Chance Creek, ensuring minimal new detrimental soil disturbance and proper pond reclamation once mining activity is completed.

Road-specific Conclusions

Closed Forest Service roads

1. The roads are required to access the site which is inside the RHCA. Therefore, the roads could not be moved out of the RHCA without eliminating site access.
2. Use of all closed Forest Service roads would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the roads are separated from the creek by at least 35 feet or more. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because they are existing roads.
 - d) No impact to the riparian vegetation because these are existing roads and they do not go through areas with riparian vegetation.
3. No potential for a discharge related to use of the Forest Service closed roads because the roads are separated from the creek by at least 35 feet of well-vegetated ground composed of needles, grasses, forbs and downed wood. This ground cover would effectively trap any sediment that exits these roads and prevent it from reaching the creek/pond.
4. Conclusions are the same regardless of alternative.

Temporary Access Road 7355-E2a

1. Using of the existing TA road is required in order to access the site which is inside the RHCA. Therefore, it cannot be moved out of the RHCA without eliminating site access.

2. Use of the TA road would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from road use because the road is not in the stream and separated from Last Chance Creek by at least 35 feet. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because it is an existing road.
 - d) No impact to the riparian vegetation because the road is existing and does not cross areas with riparian vegetation.
3. No potential for a discharge related to use of this existing mine access road because 1) this road is separated from Last Chance Creek by 35 or more feet and 2) the intervening ground cover is a mix of grasses, forbs, and downed wood. The distance, combined with the limited disturbance and ground cover, are sufficient to effectively trap any sediment that might leave the two-track and prevent it from reaching the creek.
4. Conclusions are the same regardless of alternative.

Bridge-specific Conclusions

1. The proposed foot bridge is a structure that is designed to cross a creek and decrease impacts to the stream banks and channel bed. Therefore, it cannot be moved outside the RHCA because to do so would place it in an area where a bridge is not necessary.
2. Installation and removal of the foot bridge would be in compliance with MM-2 under both alternatives as it pertains to streams and activity inside the RHCA because
 - a) No impacts to water quality for the reasons listed in #3 below.
 - b) No impacts to inchannel complexity or channel morphology from the bridge because only a foot bridge made of up boards of wood that would cross the creek. The foot bridge would not exert any pressure on the stream banks or result in bank disturbance. Therefore, there would be no impacts to stream banks and no change to width/depth ratios.
 - c) No new soil disturbance because only planks of wood.
 - d) No impact to the riparian vegetation because these are existing roads and they do not go through areas with riparian vegetation.

3. No potential for a discharge related to seasonal installation, removal or use of the foot bridge because the foot bridge is simply boards of wood placed so that the miners can walk across the creek. No bank disturbance is anticipated and no impacts to existing ground cover. Therefore, no sediment is expected to be generated as a result of the foot bridge or soil exposed and that could be eroded.
4. Conclusions are the same regardless of alternative.

Yellow Jacket (Placer)

Site visited by district hydrologist on November 1, 2004 (Field book 4).

Structures related to the Yellow Jacket operation that were evaluated for compliance with MM-2 are an existing temporary access road only. The ponds and TA road 1305-E1b are on private land.

Plan information

Water from Orofino adit located on private land will be used for processing (p. 3).

Water from the adit on private land is used for processing.... Orofino Gulch downstream of the processing site flows through old dredge ponds and seeps into the gravel before entering Olive Creek.....All water will be contained in ponds (p.5).

The Plan sketch shows two ponds located on private land. One of them has been filled in (C. Helberg, pers. comm., 9/19/10).

Source of processing water = adit discharge

Field observations

Orofino Gulch is in the Olive Creek drainage. It has intermittent flow and is non-fish bearing. RHCA = 100 ft/side as in a priority watershed The gulch has been historically hydraulically mined and there is no continuous channel that connects the gulch with Olive Creek. Orofino Gulch has seasonal flow with water disappearing into the tailings.

Pond-specific information

Processing takes places on private land. The Yellow Jacket ponds are on private land and the RHCAs do not apply.

Road-specific information

Miner proposes to use two existing temporary access (TA) roads (Appendix 6). They are a mix of native surface and tailings.

1305-E1a: This road is more than 300 feet from any stream channel and occurs through the old tailings. Road length is 0.11 miles. It is outside the RHCA and MM-2 does not apply.

1305-E1b: This road occurs on private land. It is discussed under Cumulative Effects. Road length is 0.15 miles.

Pond-specific Conclusions

1. N/A. The ponds are on private land.
2. N/A. The ponds are on private land.
3. Potential for a discharge is discussed in the Cumulative Effects section of the *Water and Soil Resources* section in Chapter 3 because the ponds are on private land.
4. Conclusions are the same regardless of alternative.

Road-specific Conclusions

1. N/A. The existing TA road on national forest land is outside the RHCA.
2. N/A. The existing TA road on national forest land is outside the RHCA.
3. Potential impacts of using 1305-E1b are addresses in the Cumulative Effects section because on private land.
4. Conclusions are the same regardless of alternative.